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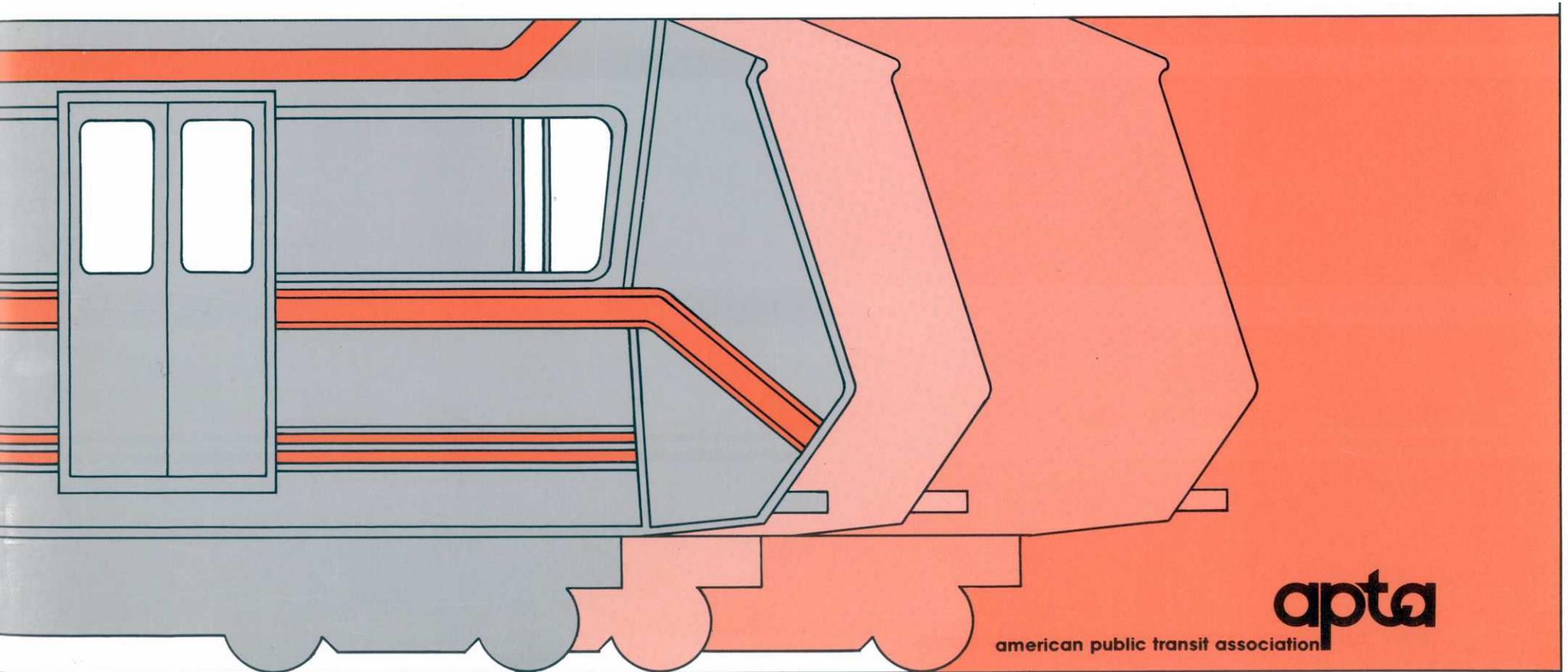
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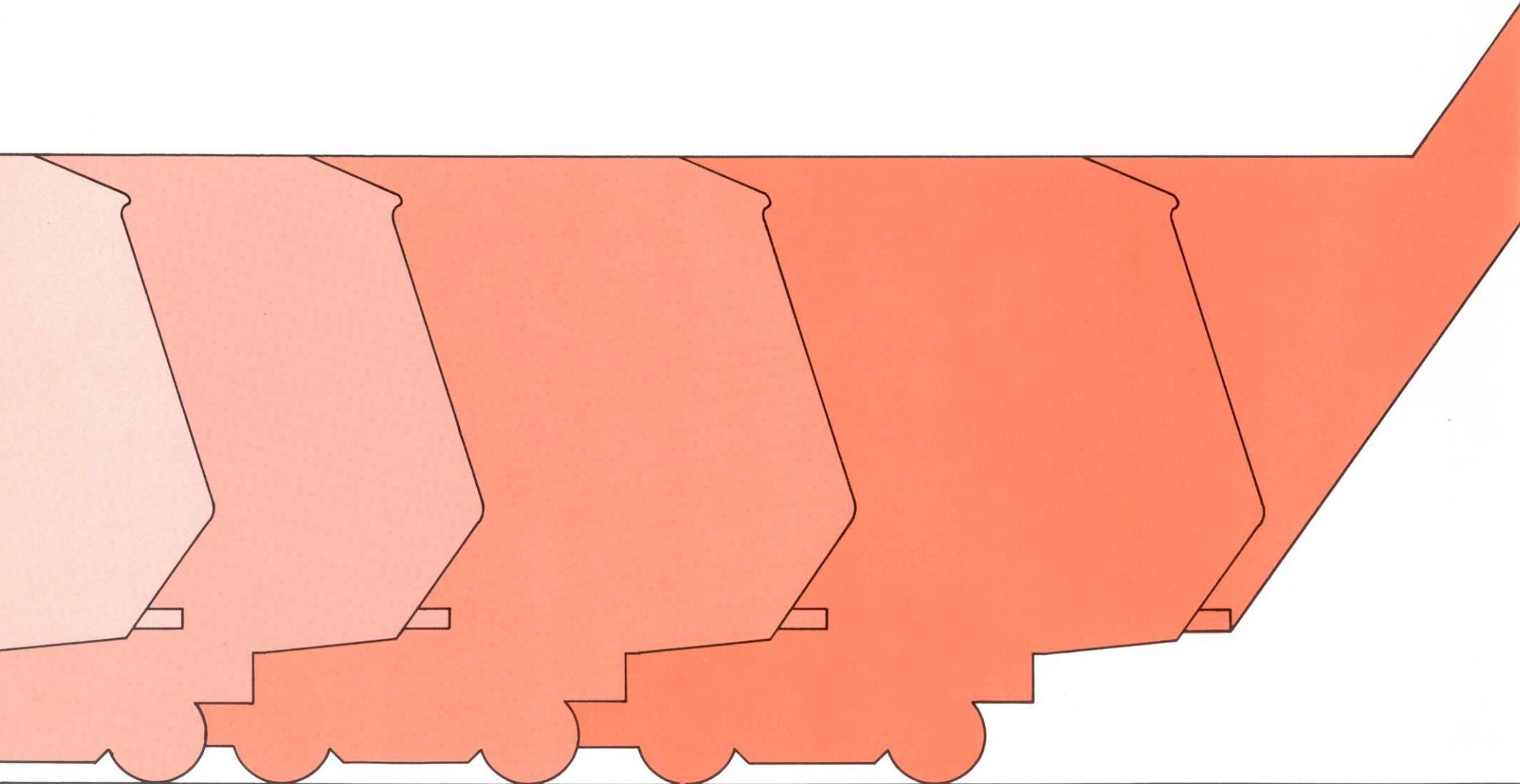
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Modernizing Rail Transit For Today's City





Modernizing Rail Transit for Today's City

a report by the

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Robert M. Coultas

Stanley G. Feinsod

Herbert J. Scheuer

Written by

Ronald J. Hartman

Senior Transportation Planner

Planning and Policy Analysis

Edited by

Judy McCormally

Associate Editor

Communication Services

Layout and Design by

K Storck

Managing Editor

Communication Services

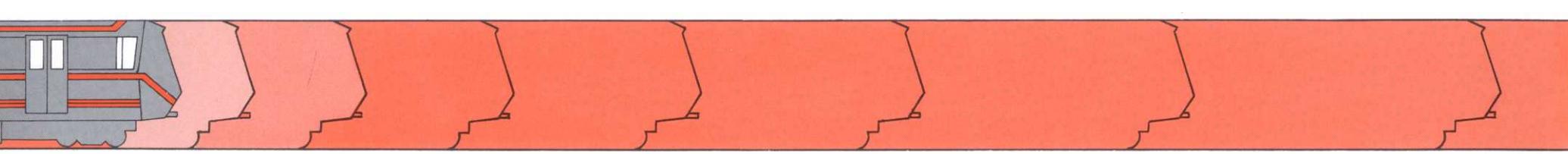
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1100 17th street, n.w.,

washington, d.c. 20036

phone (202)331-1100



Changing Cities...

In a society which is becoming increasingly urban, in a nation where three-quarters of the population lives in a metropolitan setting, cities remain unique entities—unique to every other form of settlement and unique to each other. Despite the hundreds of North American communities which can be defined as cities, each offers something different and functions according to an individual set of priorities.

Yet, there is one generality; one broad quality that all cities exhibit—constant change. Our urban areas are consistently redefining their roles and rebuilding their structure. Our urban areas are expanding. Their residents are demanding new services and higher qualities of life. The functions of the downtown and other sections of the region are being altered. The nature of development and spatial patterns are all in transition.

In most cases, this is all for the best. Downtowns are becoming diverse, regional focal points with blends of housing, shopping, offices, services, and entertainment. Neighborhoods are being preserved, with homes being renovated, services expanded, and a new community identification emerging. Acres of concrete are giving way to open space and parks. The needs of the pedestrian are getting top billing.

This report is about these changes, specifically those associated with urban rail transportation.

In 1977, APTA published *The Case for Rail Transit*, a discussion of the role urban rail is playing in the movement of people, in environmental protection and energy conservation, in urban development, and in land use. One year later, a companion piece, *The Future of Rail Transit*, applied those concepts to the cities which are planning or building rail systems.

Now, *Modernizing Rail Transit for Today's City* focuses on the nine cities which have a history of rail service and are now rebuilding and upgrading those systems as part of overall revitalization efforts.

Rail modernization is taking place in three general categories—urban and community development projects; extensions, new vehicles, and station modernizations; and new technology.

Urban development reflects a new generation of urban centers which are integrated with and oriented to rail service. Consider Philadelphia's Gallery commercial center in which the bulk of customers arrive by one of three adjacent rail lines; consider Boston's Southwest Corridor rail line which is the centerpiece in an encompassing community development strategy; or consider Chicago where rail access increases the attractiveness of the State Street transit mall.

The construction of extensions, the purchase of new cars, and the rehabilitation of

stations are part of programs to manage growth and complement renewed interest in central cities. Consider Toronto with its Scarborough light rail segment to ease development pressures in the most rapidly growing part of the metropolitan area; consider San Francisco with its Muni Metro to more efficiently carry people into the burgeoning Market Street corridor; consider Montreal with a program of extensions that will triple the size of the original subway system; and consider New York with a program to revamp 84 stations this year.

Finally, advances in technology are being made to ensure the maximum levels of efficiency and safety in carrying passengers. Consider Cleveland with the construction of a completely new Operations Control Center; and consider Pittsburgh with a large-scale reconstruction of its South Hills light rail right-of-way.

Each of these is not an isolated example. Instead, each transit improvement represents part of a coordinated metropolitan program to provide a higher level of services to residents.

That's the kind of change that this report explores—rail modernization's role in change that is creating a new city, a more exciting, a more stimulating, a more convenient, and most of all a more livable urban place.

New York

Every working day, passengers in numbers equal to the entire population of the state of Maryland ride rail transit in and around New York City. These four million people do so on over 9000 vehicles, along 830 route miles, and through 730 stations.

With this staggering set of statistics, New York operates one of the oldest and most expansive networks of rapid transit and commuter rail lines in the world.

Over the years, the grid of tracks beneath the surface of Manhattan has become as much a part of New York life as its theaters and stores. In a city where people think twice before driving into the business center, transit—and particularly rail transit—carries the lion's share of work trips. This heavy transit orientation coupled with New York's densities helps to explain why per capita consumption of energy for transportation in the city is 47% of the national average.

In recognition of New York's dependence on its mass transportation system, a major program of rail modernization and rehabilitation has been set in motion, designed to upgrade commuter and rapid transit cars and facilities.

The largest program is the \$805 million accelerated transit program, developed by the

state of New York, the city of New York, the Port Authority of New York and New Jersey, and the Metropolitan Transportation Authority; signed into law on March 1, 1979. Over the next three years, it will provide \$40 million for commuter rail rehabilitation; over the next six years, \$610 million for subway refurbishment. The projects in this program are in addition to basic maintenance and improvement programs.

Rapid Transit Program: The largest constituent agency of MTA is the New York City

Transit Authority, which operates the city's subways. Now celebrating its Diamond Jubilee-75th Anniversary, the subway system includes 710 miles of track, 458 passenger stations, 6400 transit cars, 182 power substations, and 18 railroad yards. Each component is suffering to varying degrees from age. Addressing each factor, the program will provide:

- installation of 60 energy-saving, treadle-operated escalators in 45 of the system's 458 stations;

New York: The Facts

Current System

Length:	231 miles (heavy rail); 599 miles (commuter rail)
Rail Cars:	6560 (heavy rail); 2577 (commuter rail)

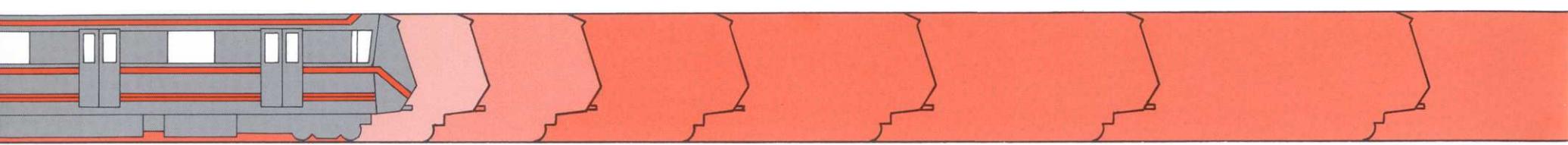
Improvement Highlights

Under Way:

- \$805-million accelerated transit program including modernization of and improvements to heavy and commuter rail vehicles and facilities;
- completion of 3.6-mile 63rd Street tunnel connecting Queens and Manhattan and segment in Jamaica;
- private financing of subway beautification through Adopt-A-Station program; and
- rehabilitation of 84 stations under Operation Facelift; program to include 50 more stations in 1980.

Planned:

- joint development including station modernization and concourse construction in 34th Street-Herald Square, 42nd Street-Eighth Avenue, and Grand Central Station.



- retrofitting of 1540 cars with air conditioning;
- modernization of subway communications and signal systems;
- expansion of the on-going noise abatement program with continuous-welded rail and the installation of a special noise abatement block between express and local tracks;
- construction of four power substations and installation of new power equipment;
- modernizing doors for 3681 subway-cars;
- installation of closed circuit television for station and platform surveillance at

selected high-volume stations; and

- new ventilation and drainage equipment.

Over the next six years, each station will receive some form of improvement.

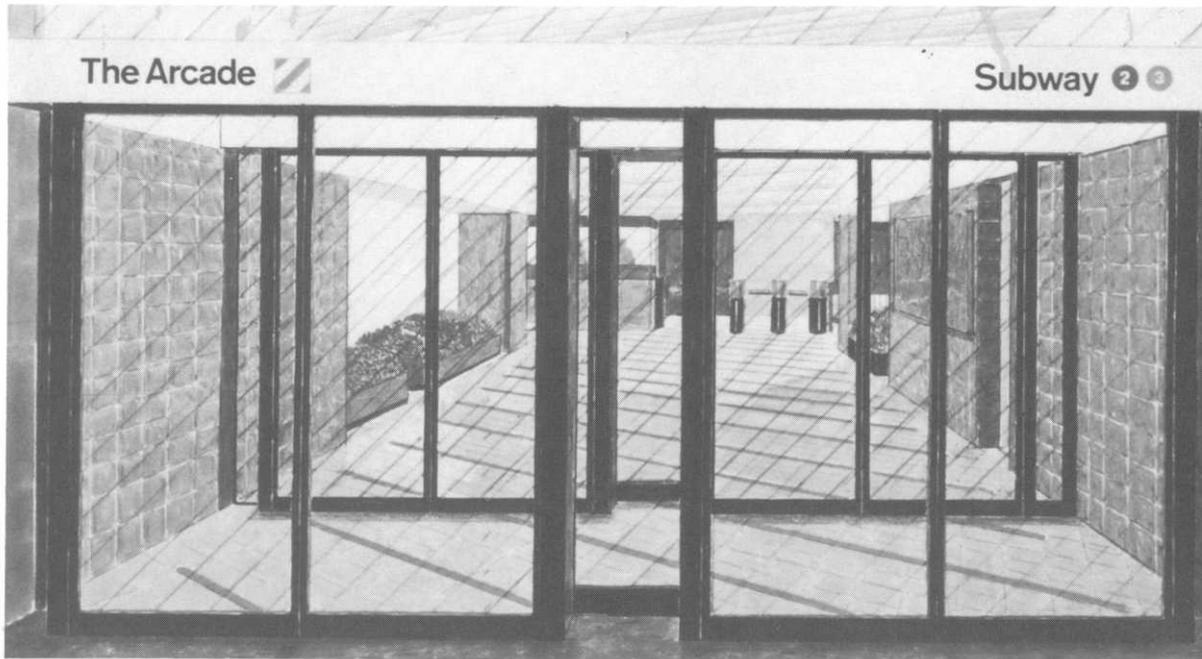
Commuter Program: Conrail and the Long Island Rail Road serve MTA's suburban passengers. These commuter lines receive about \$40 million annually in state and federal funds for on-going maintenance and improvement programs. The plan would provide an additional \$40 million—\$32 million in federal funds—over the next three years for additional or expanded improvements.

Conrail, which serves commuters from Rockland, Orange, and Westchester counties, will receive a total of \$20 million under the accelerated transit program.

To maintain and improve commuter services on Conrail's Harlem, Hudson, and New Haven Lines, and the main line from Suffern to Port Jervis, the program will provide: \$9.73 million for station improvements; the purchase and rehabilitation of 20 multiple-unit cars for \$4.2 million; the modification of 45 cars for \$2.7 million; rehabilitation of 10 electric diesel locomotives for \$4.5 million; and rebuilding and refurbishing 10 cars for multiple-unit operation for \$1.3 million.

Under a separate program, Conrail would receive \$45 million for the extension of electrification on its Hudson Line from North White Plains to Brewster and will provide rolling stock for the Harlem and Hudson lines. This portion of the Conrail program includes: rehabilitation of 60 former New Haven Line cars, including acquisition of 18 cars; construction of nine substations to supply electric traction power; installation of current-carrying third rail; signal and communication modifications; and rebuilding of seven dual-powered locomotives for interim service on the Upper Harlem Line and continued service on the Hudson Line.

The Long Island Rail Road is the largest suburban railroad in the New York metropolitan region in terms of volume. It carries almost half of the region's commuter rail passengers. An average of 240,000 passengers



used the railroad each weekday during 1978.

To provide improved service to Long Island passengers, the accelerated transit program will provide \$20 million for: station improvement; construction of a new electric car and locomotive-hauled car maintenance shop and a new car cleaning facility with two 10-car tracks; and installation of a new microwave communications system on LIRR.

Extensions: While the accelerated transit program stresses the renovation of the existing plant, New York is working to finish a number of key connections and extensions.

Roosevelt Island—a new town development—will be joined to the subway network with the completion of the 63rd Street tunnel. The housing, retail, and community facility complex lies on the island in the middle of the East River between Manhattan and Queens. With a string of high-rise apartments and condominiums set along a curving, largely traffic-free Main Street, the community features promenades and plazas looking over to the East Side skyline.

The opening of rail service to Roosevelt Island will put residents within five minutes of midtown Manhattan's shopping, office, and cultural attractions. The on-going construction program includes a 3.6-mile stretch from Northern Boulevard in Queens, under the East River to Roosevelt Island, and continuing under the East River, 63rd Street, and Central Park in Manhattan, where the line will join existing Sixth and Seventh Avenue routes. A related program will finish the Archer

Avenue Line which is in Queens.

Joint Development: Given the traditionally strong linkages between rail transit service and private urban development in New York, several projects which are under way will further integrate subway and commuter lines with adjoining commercial centers.

In a joint venture exemplifying private sector cooperation with public corporations, MTA, working closely with New York City and the Port Authority of New York and New Jersey, has developed a \$40 million joint development project for the renovation of three mid-Manhattan transportation hubs. These are 34th Street-Herald Square—the city's largest retail district, where nearly 500,000 trips are made into and out of the area on an average day by rail alone; 42nd Street-Eighth Avenue—portal to New York City's theater district and coordinated with the new Port Authority Bus Terminal expansion where trains make over 80,000 daily trips; and Grand Central Station—one of the major transportation centers in the Manhattan central business district. The improvements called for include not only station modernization, but modernization or construction of concourses and passageways to make the total environment more pleasing to passengers and consumers.

Adopt-A-Station: In 1975, MTA inaugurated the Adopt-A-Station program designed to generate public interest and private capital for improvements to New York City subway and commuter rail stations. The program was

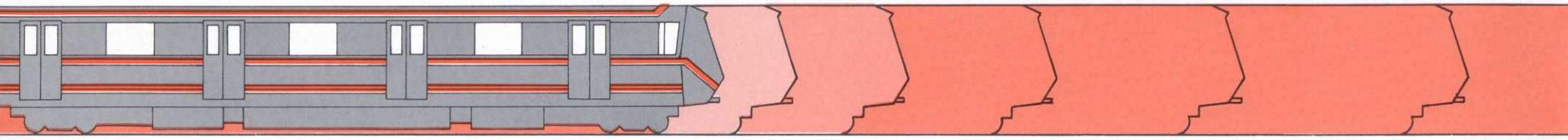
initially so successful that UMTA provided MTA with a special \$500,000 grant to match on a dollar-for-dollar basis any new private contributions for subway beautification. The 14th Street-Union Square station renovation will be completed this year and has received support from Con Edison, Citibank, and *Forbes Magazine* among others. The Wall Street, Clark Street, Astor Place, and Hoyt Street stations will all undergo major refurbishing as a result of public and private sector cooperation. Plans are under way to involve other stations and their communities.

Operation Facelift: Other rehabilitative programs under way include Operation Facelift, scheduled for completion later this year. Under Operation Facelift, 84 high-use subway stations are being repainted, getting new signs, and receiving a general cleanup.

The program is meeting with much approval, meriting a recent piece in the design section of the *New York Times*. In that article, commenting on the use of beige and green colors in the West Fourth Street station, writer Paul Goldberger notes, "The colors are handsome in themselves, they go together well, and they make for a warmer, brighter place overall." He describes the mezzanine as "a forest of yellow columns."

Plans are now being formulated to extend Operation Facelift to an additional 50 stations next year.

As the completion dates near for this myriad of improvements, New York is dramatically illustrating its role as an urban rail hub.



Montreal

The quality of urban life in Montreal is nearly unequalled anywhere else at every level, particularly the lower level because that is where the Metro is. Since the blue and white trains began running in 1966, the subway has generated an elaborate seven-mile maze of concourses and passageways which makes life underground every bit as exciting and stimulating as life at

the surface. Especially when snow, ice, and bitter winter temperatures take hold, for many people it is possible to go to work, shopping, school, and theaters without even a topcoat.

Metro service supports nearly all of Montreal's major activity centers. Direct access, which in many cases means the rider does not have to go outside, or nearly direct access is provided to the main bus terminal, two railway stations, the Olympic Stadium, eight hotels, the Stock Exchange, a large concert hall, dozens of office buildings, 10,000 indoor parking spaces, bank branches, almost 1000

boutiques, three department stores, numerous restaurants, bars, and movie houses, art galleries, and a university campus.

Montreal and surrounding jurisdictions have clearly tied their growth and development plans to subway service. Terminal stations on each line, besides acting as bus and automobile collectors, have become an essential element to the development of residential, industrial, and commercial areas. Typical is Atwater Station. Although no longer a terminal, with the recent opening of the Angrignon extension, the station is situated beneath a major shopping complex including a large supermarket. A range of housing development, both low and high-rise, is nearby.

Shortly after the Metro opened, it began carrying riders to Expo 67, Montreal's world's fair, situated on several islands in the St. Lawrence River. At that time, the subway provided one of the few means of traveling into the center of fair activities, as all automobiles had to remain on the mainland. During those early days, it carried tremendously heavy loads, adding to the exposition's success.

Once again, the Metro carried record numbers of people in 1976 during the summer Olympics held in Montreal. Again the Metro was credited with providing smooth access for an event which could have caused a transportation nightmare.

The Olympic site was served by a subway extension that opened several months before the games took place. This extension is one of many that has continually occupied the minds



of Montreal transportation planners. It seems that almost from the earliest construction work, extensions were being planned. Currently, the Metro is in the midst of an expansion program that will nearly triple the initial subway system.

Extensions: Since 1967, the east-west Line Number 1 has been extended twice. In June 1976, trains began running beyond Frontenac to Honore-Beaugrande, serving the Olympic site among other areas. In September 1978, the west terminal of the line was pushed back to Angrignon with eight additional stations. Angrignon is a major regional park, and with a surface-level station, the setting is most attractive.

A four-station extension of Line Number 2, west of the Bonaventure Terminal, will run to Vendome, starting during fall 1979.

The full extension program for Line Number 2 includes 15 new stations over nearly 10 miles of track, terminating at Salaberry at the northern part of the island of Montreal. Excavation is under way for about half of the route beyond Vendome with planning and design activities being conducted on portions of the remainder.

Line Number 5, a wholly new route, would run from LaFleur in Lachine in Montreal's southwest to Amos in Montreal-Nord in the region's northeast. Cutting a roughly diagonal route across the city, it would provide interchange with other lines and most of the major bus routes, as well as serving the University of Montreal. At present, construction has begun

Montreal: The Facts

Current System

Length:	23 miles
Vehicles:	759

Improvement Highlights

Under Way:

- extension of Line Number 2 to Salaberry; and
- construction of Line Number 5 connecting Lachine with Montreal-Nord, running southwest to northeast across the city.

Planned:

- development of a route from the eastern terminal of Line Number 1 to Pointe-aux-Trembles.

on a short segment and planning and design work is nearing completions for much of the rest.

An additional extension would bring service to Pointe-aux-Trembles at the island's far eastern tip.

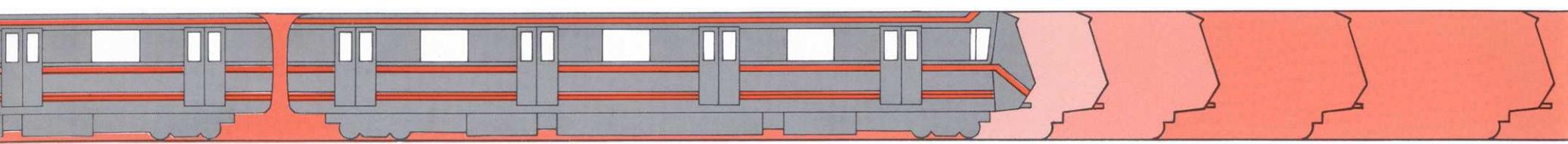
To serve the program of expansion, 423 new rail cars have been purchased. Like their earlier counterparts, they will run on rubber tires. Moreover, signaling, central control, supervisory control, and trainphones have been revamped completely throughout the existing system.

With about 23 miles and 43 stations in service now, implementation of the expansion program will add over 27 new miles and

52 stations. The entire extension project is estimated to cost \$1.6 billion (Canadian dollars), with almost \$700 million (Canadian dollars) worth of contracts awarded so far.

The effects of these extensions in the central business district has to generate even more interest among developers in constructing direct entries to the subway. Since 1971, three structures have been joined to the McGill Station, one to the Sherbrooke Station, three to the Berri-de-Montigny Station, and one each to Jean-Talon and Jarry. With the cost of these passageways totaling over \$2 million (Canadian dollars), the greater part of the funding has been borne by the private sector.

Studies conducted in 1977 show that daily



patronage on the Metro has increased by 60,000. Much of this was attributable to the extension of Route 1 and the reorganization of a number of bus lines to serve new stations. Consequently, the number of cars in the downtown has decreased by 4000 in the morning rush hours.

Clearly, by all measures, Montreal's experience with rail transit has been most rewarding, the best proof being the approximately 150 million passengers who ride each year.

Philadelphia

Perhaps Philadelphia's enthusiasm for its rail network is illustrated by the signs at Philadelphia International Airport directing you to trains bound for downtown. The platforms and the stairways are all there, but the wait may be a little long for the average business traveler—two years approximately, because the line is still under construction. Nevertheless, as you enter Philadelphia, it is clear that rail improvements are part of the everyday scene.

The City of Brotherly Love is indeed a transit city and indeed a rail city. About 80% of daily downtown work trips are made on the bus, streetcar, light rail, heavy rail, and commuter rail lines which serve almost every part of the metropolitan area. Much of downtown Chestnut Street has become an attractive transit mall. Streetcar lines crisscross

downtown streets. High-speed light rail serves outer areas. Heavy rail provides north-south and east-west spines and connects southern New Jersey with the city. And, commuter rail links the city with the farthest reaches of suburban counties.

As the nation's fourth largest city, Philadelphia has maintained a vibrant mix of downtown activity and neighborhood diversity. As part of a strong back-to-the-city movement, thousands of people have restored homes and built new ones in inner city areas. Substantial amounts of new construction are apparent throughout the city and the suburbs. Even the Liberty Bell stands in a new structure. And, transit is credited with playing a major role in preserving and enhancing Philadelphia's quality of life.

The Gallery: Typical of what is occurring in center city and of the vital link between urban development and supportive transportation is the recently opened Gallery. The Gallery rewrote the book of downtown revitalization. With one of the first new department stores to be built downtown in any American city in years, the Gallery built by the Rouse Company is a four-level shopping mall with 125 stores and restaurants and two department stores, and record sales per square foot—the measure of retail success. Key to its viability are three rail lines adjacent to the center—the Market Street Subway, the Broad Street Subway, and the Lindenwold Line. In addition, a major commuter rail terminal is only a few blocks away.

Research has shown that 68% of the center's customers and almost every one of its employees arrive by transit, and most of them from the rail platforms. Completely remodeled station areas vastly enhance transit entry.

Expansion of the Gallery is being planned, once again with rail transit coordination. A two-block addition, to include another department store, more shops, and two office towers will tie in with a new transportation center, part of a major commuter rail project.

Commuter Tunnel Connection: Work is in progress on a \$307 million tunnel which will connect two downtown commuter rail terminals and thus link two major rail divisions. Currently, stub end terminals—those in which trains must enter and exit from only one end of the station—serve trains on the former Reading Division at 11th and Market streets and trains on the former Penn Central Division at Penn Center, 17th Street, and Kennedy Boulevard. The tunnel will unite these divisions, which together contain about 400 miles of route, and create a highly efficient commuter rail network.

With the construction of a transportation center at 11th Street, an integral element in the entire project, passengers will be able to transfer easily among the Market-Frankford Subway, the Broad Street Subway, the Lindenwold Line, and the commuter train routes. The development opportunities presented by this kind of transportation hub are what helped to attract the Rouse Company and

others to seriously consider center city Philadelphia for revitalization projects.

In addition to the transportation benefits provided by the tunnel connection, the construction phase of the project will provide 2000 jobs, making the venture one of the largest public works projects in city history.

Airport Extension: By 1981, the downtown commuter rail facility will also be the place to go to catch trains to Philadelphia International Airport. A 9.5-mile extension, directly into the airport terminals, is under way and will cost about \$71 million.

Station Modernization: A program of station modernization has been in effect for some time.

Extensive renovations of 12 stations along the Broad Street Subway route are planned. Twenty-two million dollars has been dedicated to this effort, beginning in Fiscal Year 1980. The bulk of the money is to come from Interstate Transfer funds, indicating the region's opting to use its highway money for transit improvements. Among the improvements will be new barriers and control systems between paid and unpaid areas, lighting, floor, ceiling, and wall finishes, painting, graphics, passenger signs and conveniences, and the installation of closed circuit television. Renovations at the City Hall Station also include structural repairs and upgrading of concession areas.

Another \$12 million has been designated for modernization of the 11th Street Station of the Market-Frankford Line, a primary

facet of the transportation center and commercial construction. This is to take in architectural modernization and platform extensions. Light rail stops in suburban Delaware

County will receive new shelters, lighting, and parking lots and offer amenities as well.

On the commuter rail side, the Southeastern Pennsylvania Transportation Author-

Philadelphia: The Facts

Current System

Length:	155 miles (light rail); 211 miles (heavy rail, SEPTA); 15 miles (heavy rail, PATCO); 374 miles (commuter rail)
Vehicles:	83 (light rail); 466 (heavy rail, SEPTA); 75 (heavy rail, PATCO); 411 (commuter rail)

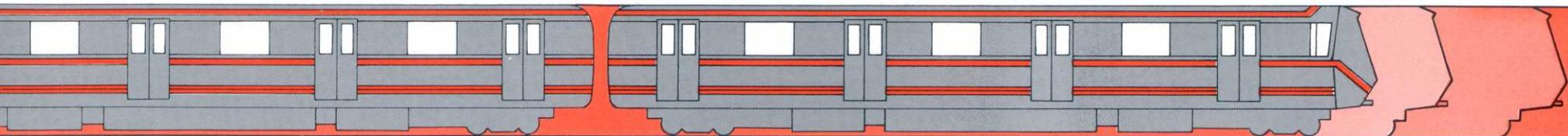
Improvement Highlights

Under Way:

- construction of a tunnel to connect two major commuter rail divisions and development of a transportation center;
- construction of commuter rail link from downtown to Philadelphia International Airport;
- renovation of heavy, light, and commuter rail stations;
- purchase of new light rail vehicles;
- rehabilitation of light, heavy, and commuter rail cars; and
- upgrading of rights-of-way and electrical power systems.

Planned:

- construction of fringe parking lots at intersections of major highway and commuter rail lines; and
- acceleration of facility and vehicle modernization programs.



ity has taken on a major station improvement effort including better lighting, signage, and expanded parking facilities.

One such project is to take place at the Warminster Station on the Hatboro Branch. Located in Bucks County, commuter trains began serving the station in July 1974 with the completion of a 1.8-mile extension. Within eight weeks of the start of service, the parking lot was operating at close to capacity. Land has been acquired for further parking expansion and the addition of about 700 spaces is to begin during 1980. Other projects will produce standardized signs with uniform language and graphics. Where stations are not located on a main thoroughfare, signs will be erected on nearby roads to serve as a constant reminder to drivers of the rail alternative and to inform new residents and nonriders of the locations.

Under a program sponsored by the Pennsylvania Department of Transportation, fringe parking lots are planned at four sites where interstate highways and commuter rail lines intersect. Direct ramps from the highway will provide access to 1500-2000-space lots and new and rebuilt stations. Park-and-ride projects are set to be constructed near such roads as Interstate 95 and the Pennsylvania Turnpike.

New and Reconstructed Vehicles: New and rebuilt rail cars are in the works for light, heavy, and commuter services.

In April 1979, a \$67.2 million contract was awarded for new light rail vehicles. The first

of the new cars is to be received in 1981 and the order completed in 1982. Delivery of the cars will be timed to coincide with the construction of new light rail maintenance and storage facilities in southwest Philadelphia and a heavy maintenance facility at the Woodland depot. The cars will be used for the City Transit Division Subway-Surface routes and the Media and Sharon Hill lines. The latter two services operate on reserved rights-of-way with limited stops.

Fifteen-year old cars on the Market-Frankford Line are scheduled for a general overhaul. These cars provide 180 million passenger miles and 8.5 million vehicle miles each year. Elements of the rehabilitation include replacements of wheel bearings, air compressors, propulsion motors, and batteries. Installation of air dryers to prevent winter freeze-up problems is also part of the program.

Another major program will rehabilitate existing PCC streetcars. It is planned that the best of the all-electric cars from the present fleet will be rebuilt to extend their life for another eight years. This will coincide with the present light rail car delivery schedule and putting those cars into operation in subway-surface lines.

Better speeds, faster travel times, and increased ridership are expected to result from the purchase of 21 rail transit cars to serve the Norristown High Speed Line. The route operates from the 69th Street Terminal to Norristown through Delaware and Montgomery counties, and presently serves over

two million passengers annually.

As part of the major capital improvement program of the city of Philadelphia, \$126 million has been targeted for new heavy rail cars to serve the Broad Street Subway.

The commuter rail fleet is to be augmented with 50 new cars and modification to 306 existing "Silverliners" to meet the requirements of the Northeast Corridor. Incidentally, with the purchase of 232 "Silverliners" from General Electric over the last few years, nine-tenths of the commuter services are run with relatively new equipment.

Maintenance and Operational Improvements: Along with station and vehicle revampings, an agenda of maintenance and operational improvements has also been established. This includes upgraded trackbeds and signal systems on all divisions, rehabilitation of trolley poles and overhead wiring, reconstructed at-grade crossings, particularly on the Media and Sharon Hill light rail lines, substation modernization, additional line segments of electrification on the commuter rail network, and general improvements to provide for the integration of the commuter tunnel/transportation center project and the airport link.

Nearly a billion dollars in construction, reconstruction, and new purchases of rail equipment and facilities are in the advance stages of planning and implementation in the Philadelphia region. All of this underscores a dependence on rail as a structural backbone for city and suburban growth.

Boston

Walk the streets of Boston and 200 years doesn't seem all that long. Evidence abounds that once there was an American revolution, a struggling colony, and a fledgling port.

If you're looking for America's history, Boston is the place to be. And more and more, it is also the place to be if you're looking for America's future, particularly its urban future.

Side-by-side with Old North Church and the Boston Common, a new Boston has come into its own. It is characterized by high-rise complexes like the Prudential Center and Government Center, with mixes of apartments, major retail stores, offices, hotels, and entertainment activities. Yet in the shadows of the concrete, steel, and glass, rehabilitated structures like Faneuil Hall and Quincy Market have been brought to life once again as commercial centers. Along the waterfront, an extensive revitalization program is taking shape. Key to these efforts is the renovation of once-deteriorating wharves and warehouses.

Beneath the streets, rail transit is also an important part of the new Boston. The nation's oldest system is being revamped with the extension of lines, the addition of vehicles, the rebuilding of stations, and the implemen-

tation of maintenance and wayside improvements.

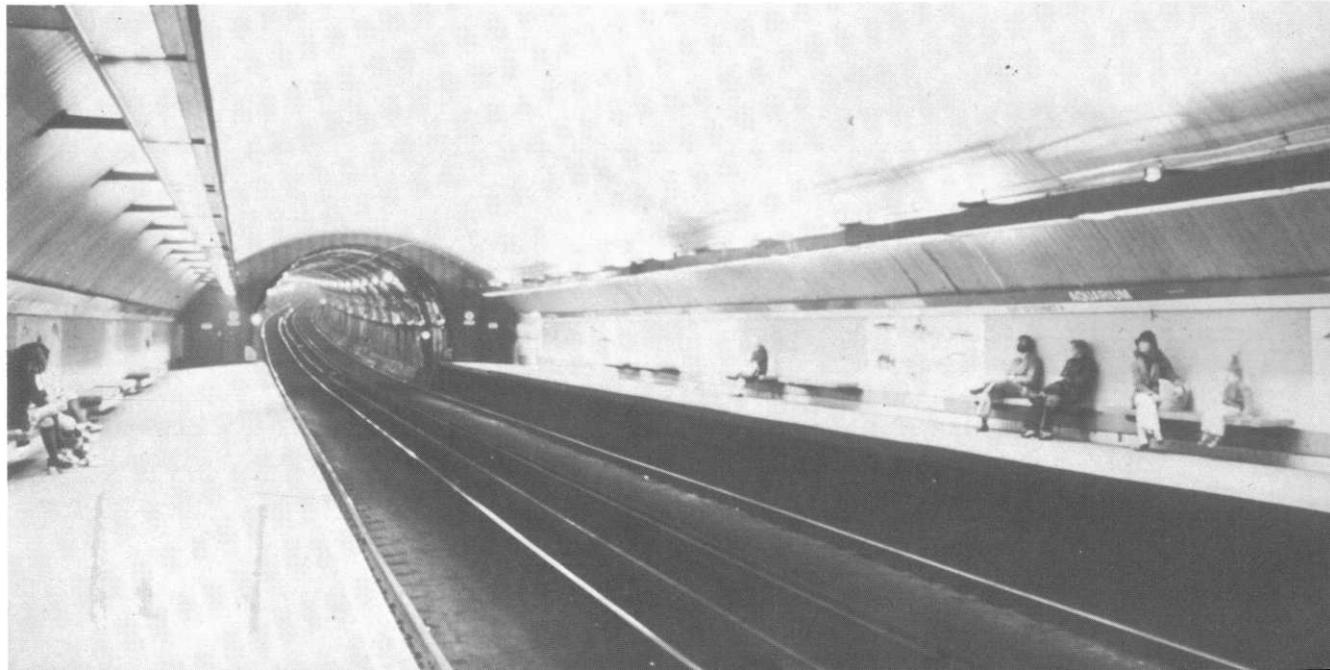
Red Line Extensions: Running from the gates of Harvard University in Cambridge through downtown Boston and south, the Red Line was extended several years ago to Quincy Center. With a high-rise parking lot over the platform, suburban commuters found park-and-ride to be a simple matter of stepping onto and out of an elevator. Since that time, the Red Line has pushed farther south to Braintree, Mass., with a three-mile, two-station extension. The segment is expected to begin carrying riders during December 1979.

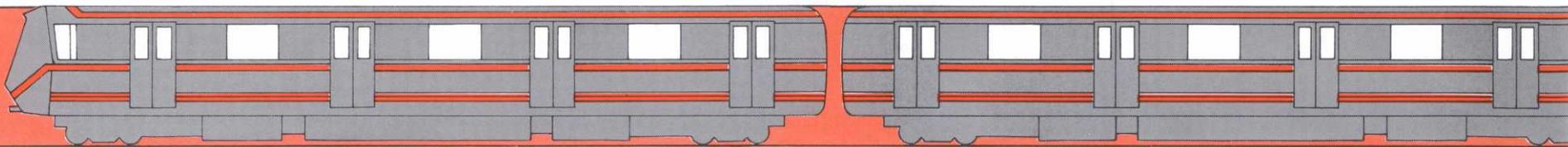
At the northern end of the line, the first phase of work is under way on an extension that will eventually take Red Line rail transit

service out as far as Route 128, Boston's major circumferential highway. This initial construction will bring urban rail three miles beyond Cambridge into the neighborhoods of North Cambridge, Somerville, and Arlington. With stations at Porter Square, Davis Square, and a terminus at Alewife Brook Parkway, access will be provided to thousands of residents, enhanced with park-and-ride facilities and revamped bus feeders.

At a cost of \$460 million, the Red Line extension will provide substantial time savings to transit users, attracting many new patrons. Riders in the corridor who currently take a bus to Harvard Square and change to the subway will save up to 15 minutes of travel time with the direct link.

Key to the project are a number of com-





Boston: The Facts

Current System

Length:	62 miles (heavy rail); 38 miles (light rail); 244 miles (commuter rail)
Rail Cars:	339 (heavy rail); 460 (light rail); 176 (commuter rail)

Improvement Highlights

Under Way:

- six miles of extensions to Red Line;
- five-mile relocation of Orange Line;
- rehabilitation of stations including new Washington Street concourse;
- purchase of 190 heavy rail vehicles;
- completion of purchase of 175 light rail vehicles;
- purchase of 60 new commuter rail cars; and
- on-going program of maintenance and plant improvements.

Planned:

- additional extensions to Blue, Green, Orange, and Red lines; and
- development of South Station Transportation Center.

munity development factors. A new access provided to the Alewife area is expected to stimulate planned development for commercial and residential uses.

In addition, subway extension will bring major changes to the Harvard Square area. Entrance to the existing Harvard terminal is provided by a kiosk in the center of congested Harvard Square. Currently, the square is a major activity center for Cambridge, including a prominent entrance to the university, a movie

theater, office buildings, the multistory Harvard Coop retail facility, and a string of restaurants, bookstores, and neighborhood services, all of which tend to generate a nearly 24-hour-a day street life. Currently, extremely heavy vehicular traffic poses obstacles to unhampered pedestrian movement and rail access. As part of the Red Line extension, the Harvard station will be completely rebuilt and the square above redesigned. The plan includes more plaza area for pedestrians with fewer

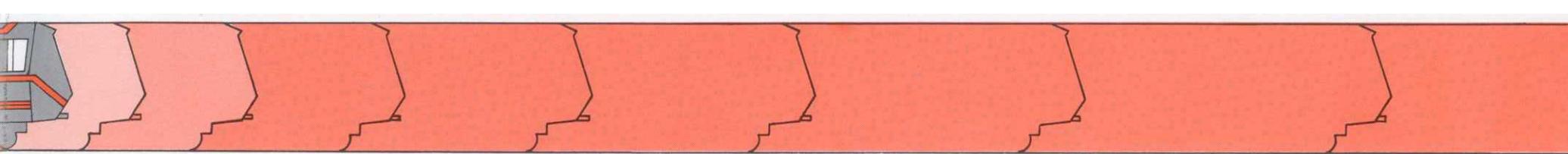
automobile intersections, as well as the construction of a new subway entrance and elevator entrance and the restoration of the original kiosk. Congestion will be further reduced by the shifting of many boardings to the new stations being built farther out

A temporary Harvard terminus has been erected while rebuilding continues in Harvard Square, and passengers should be able to ride to Alewife by 1982. In conjunction with the extensions, platforms at most of the existing Red Line stations are being lengthened to accommodate longer trains, greatly enhancing capacity.

Orange Line Relocation: A Boston rail project with direct community development implications is the relocation of the southern portion of the Orange Line. Currently, Orange Line trains run from Oak Grove, on a recently opened extension serving the northern suburbs, through the central business district, and over Washington Street to a terminal at Forest Hills. Relocation south of downtown, in what is known as the southwest corridor, is one element in a major urban revitalization effort.

The southwest corridor contains a number of deteriorating neighborhoods with large numbers of transit-dependent, low-income residents. Unemployment and economic disinvestment are among the most severe problems. It has long been identified as an area in need of social and economic help as well as enhanced transportation opportunities for citizens.

The current program will replace the 70-



year-old elevated structure along Washington Street with a rapid transit line to run along an existing commuter rail right-of-way within the corridor. Just below the existing Essex Station, in the southern portion of the central business district, a tunnel has been completed which will carry trains to a new South Cove Station and through additional tunneling up onto the commuter rail right-of-way. The line will then run to the present terminal in Forest Hills. Eight stations are to be built along the way including a new Forest Hills facility and a station at Back Bay, which will provide convenient transfer to commuter and Amtrak intercity rail services.

Although it will be several years before the Orange Line operates in its new alignment, a number of development projects which have been stimulated by the rail project are in varying stages of construction and planning.

On land once condemned for Interstate 95 construction, groundbreaking is nearing for Roxbury Community College. Adjacent to a station on the new line, many of the educational center's students are expected to arrive by train. A large public high school, the Madison Park Occupational Resource Center, is also being planned with largely rail accessibility. Within walking distance of the Ruggles Station, which will also serve Northeastern University, the Crosstown Industrial Park is under construction. This employment center, one that might ordinarily have been lost to the suburbs, will create numerous jobs within a pocket of high unemployment and will be

within easy reach by the relocated Orange Line. Other projects on the planning board include a prime commercial center and a second high school near the new Forest Hills terminal.

Public transportation improvements in the southwest corridor are credited with helping to make the majority of these development projects feasible. Construction of the new rail segment, along with implementation of new southwest development, is expected to create 32,200 jobs. About 10,000-12,000 permanent jobs will result as well. Additionally, new development will further strengthen Boston's tax base.

In terms of transportation benefits only, trains will be able to travel the relocated line at higher speeds than currently permitted on the elevated structure. Additional stations in the corridor will increase the number of walk-in riders served, as will improved transfer arrangements at Back Bay. Estimates indicate that the relocated line will carry 55,000 in-bound trips each day, 22,000 more than the current route.

Cost for the relocation has been set at \$607 million.

Other Rail Extensions: While both the Red Line extensions and the Orange Line relocation are in progress, heavy rail extensions to other lines are being planned.

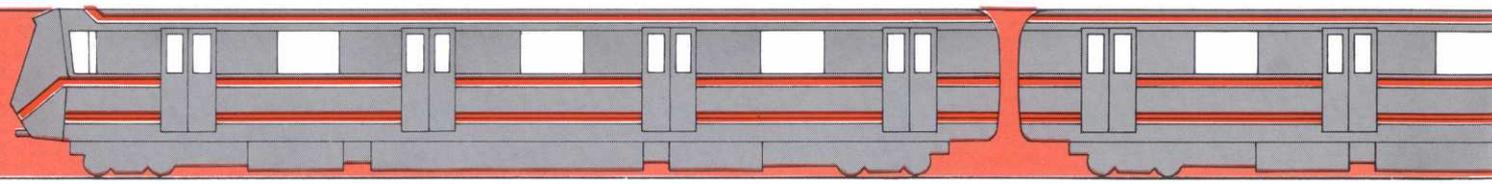
A proposal to extend the Blue Line from its northern terminus at Wonderland in Revere Beach would carry rapid transit service into Central Square in suburban Lynn. Lynn is an older urban center, developed before the days

of the automobile, and like many other urban centers, it has not been able to successfully compete with suburban shopping centers and industrial parks. By providing more convenient and faster access to Lynn by transit, it is expected that the community will become a more attractive location for potential employers, retailers, and other commercial enterprises. Similarly, improved access will enhance Lynn's attributes as a place to live. These benefits were realized in Quincy, after the extension of the Red Line was made to that city. Moreover, this is consistent with the regional goal of concentrating new development in older urban areas.

A Blue Line extension is expected to generate up to 10,700 in-bound boardings at two Lynn stations. This includes approximately 2600 automobile driver diversions and 1800 new trips.

Another project proposes to extend the Orange Line from its current northern terminal at Oak Grove north to Route 128. In addition to attracting new riders—many of whom would be former auto travelers—and reducing congestion at close-in stations, substantial savings in travel times for the corridor would result from the improvement.

Projects to lengthen the light rail Green Line include proposed extensions to Tufts College in Medford and restoration of service to Brighton. New service into Medford would pass through Somerville, with 22,590 persons per square mile, one of the most densely populated communities in the state. It is also



an area of low auto ownership, lower than average income, and high percentages of elderly residents. Benefits in terms of direct downtown service, reduced congestion with less dependence on buses, and vastly improved travel times would accrue to the communities involved. Similar enhancements of travel convenience would be associated with the Brighton service.

Other rail expansion plans include the following:

- additional improvements in the southwest corridor;
- improvements for service in the West Roxbury and Needham areas;
- rail service to Brockton; and
- development of a series of short rail connectors in Brookline Village, under Cambridge Street to connect the Blue and Red lines, and between North and South stations.

Additionally, a rail line to provide circumferential service at the fringe of downtown Boston is in the early planning stages.

South Station Transportation Center: The Massachusetts Bay Transportation Authority recently acquired Boston's South Station as part of an effort to create a transportation center for intercity and commuter trains and buses.

The center is to include an 11-track layout designed for use by both Amtrak's intercity trains and local commuter trains, an intercity and commuter bus terminal, a new station concourse and lobby, an interior passageway between the railroad station and the adjacent

Red Line station, and a parking garage. Retail and office space is also part of the plan. The design, which would preserve the existing terminal facade, includes air rights foundations for future construction.

Located in a part of the city where several new office structures have been completed in the recent past, the transportation center is expected to accelerate area renewal efforts. Moreover, the project is estimated to create about 5500 jobs.

Station Rehabilitation: An energetic station modernization program has been in operation in Boston for a number of years. New entrances, fare collection equipment, and amenities have been installed. A bold set of graphics, including station signs, maps, and murals, captures the flavor of the surrounding neighborhood.

Modernization efforts continue with roughly two stations being completely redesigned each year. Typical of these efforts is the Park Street Station in downtown.

Built in 1897, Park Street holds the distinction of being the first subway station constructed in North America. A major refurbishing has included the installation of large destination signs and route maps defining loading platform, new concession kiosks, and bright lighting with higher levels of illumination over stairways and entries. Color has been carefully coordinated with a combination of red and green tiles. A focal point for the station is a 16-panel mosaic mural which has been placed alongside fare collection equipment. Further

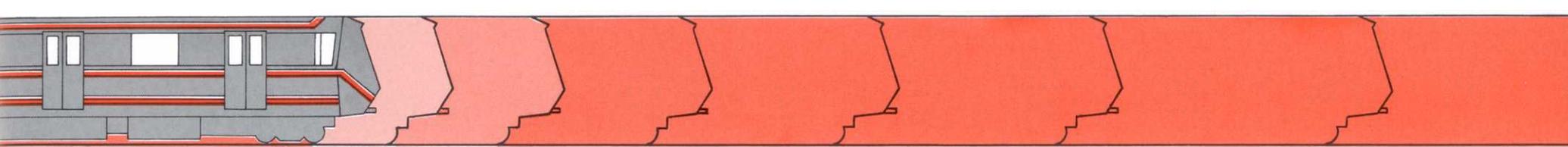
enhancing access to the station, a pedestrian tunnel which had been unused for many years was recently opened to provide transfer service to a station on another line.

Related to station rehabilitation efforts is the creation of a shopping concourse at the busy Washington Street Station. Through a combination of city, state, and private resources, an underground mall has been established for the benefit of both downtown shoppers and commuters. The remodeled station "free zone" holds a number of small shops and also has entrances to two of Boston's major downtown department stores. The station itself is used by roughly one-quarter of a million people every day.

The renovation project is tied in with an agenda of improvements to the central shopping district. These include a new Jordan Marsh store, modernization of Filene's, establishment of a shopping mall in a vacated department store, an auto free zone directly above the subway concourse, Lafayette Place commercial and hotel development, and a range of street improvements.

New Rail Cars: An extensive program of vehicle replacement and fleet expansion has been in progress for several years.

The heavy rail program is nearly complete with the recent purchase of 190 cars from Hawker-Siddeley Canada, Ltd., for use on the Orange and Blue lines. Additionally, rehabilitation of Red Line cars is also in progress. With the completion of Red Line extensions, 30 additional cars will be required.



The major part of the light rail program—the purchase of 175 light rail vehicles—is nearly complete. An in-house program to rebuild older PCC cars is also in progress. Remaining projects include the acquisition of spare parts, design changes, and other improvements for the new light rail cars and continued rebuilding.

The purchase of 60 new commuter rail coaches has also been initiated.

Maintenance and Plant Program: On the more technical side, an electric power improvement program is ongoing. This includes reinforcement of existing generating capacity, the replacement of substations and cable, and the provision of a switching station. Currently, the transportation authority generates its own power for transit use and supplements this with electricity purchased from Boston Edison.

In the area of tracks and structures, efforts are being directed at track rehabilitation, the purchase of trackwork equipment, subway structural improvements, and subway ventilation modernization.

Other modernization work involves the development of a radio communication system, general signal improvements on all lines, the reconstruction of Green Line carhouse facilities, and the rehabilitation of the Everett Shops Complex taking in all buildings and systems.

Commuter Rail: Along with the pursuit of a number of possible commuter rail extensions, a thorough agenda of upgrading is being

followed. Typical projects include:

- station renovations involving new shelters, lights, graphics, and parking lots;
- rebuilding of cars and locomotives;
- new maintenance shops;
- replacement of bridges; and
- improvements to tracks, wayside, and signals and the provision of additional storage space to reduce deadheading.

In just a few years, rail transit in the Boston area has been dramatically revamped. The next few years will bring equally vast changes offering unsurpassed levels of convenience to Boston riders. The new face of Boston—above the surface and below—may be evidence that a new revolution is being waged: a revolution in urban life.

Toronto

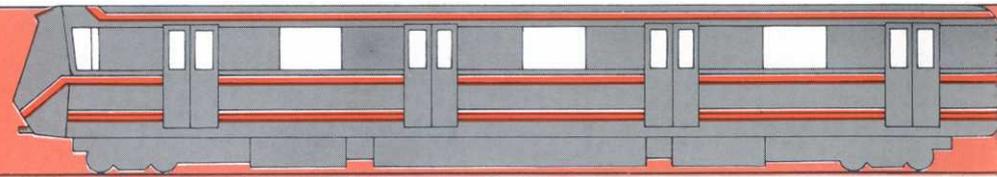
Toronto recently celebrated the 25th anniversary since trains began to roll under 4.5 miles of Yonge Street. Since that March 1954 morning, the subway length has grown eight-fold, Yonge Street has become a transformed thoroughfare of high-rise commerce and 24-hour activity, and Toronto has emerged as one of North America's urban stars.

Regardless of how those events are related, Toronto is today a working, livable, and exciting place. The downtown is vibrant and re-

presents massive investment of private capital. Central Toronto serves as a center for business, housing, retailing, services, and entertainment for a metropolitan area housing nearly 2.3 million people. Major multipurpose complexes like Eaton Center and a maze of underground concourses and passageways provide a pedestrian orientation of grand scale.

Farther out in the region, the effect of metropolitan preferences to foster clustered development patterns is evident. Housing, shop-





ping, and offices converge around central points, creating travel corridors and travel demand that can be served efficiently.

One explanation of the high quality of urban life in Toronto is apparent in the history of its urban development. Its recent evolution offers a case study in the integration of policies. With a metropolitan-level government, Toronto long ago realized that concerns of land use, transportation, environment, and economics are not separate sets of issues to be addressed in a vacuum. Actions were to be supported and complemented by a range of local policies.

Perhaps no better example exists than in the area of transit, and particularly rail transit. With an outstanding bus and streetcar system in place, Toronto's approach to rail has been of both an incremental and integrated nature. The existing network grew from 4.5 miles to over 32 in short segments. Subway construction has been under way in some part of the region for 30 consecutive years. At the same time, rail growth has been accompanied by policies which are designed to ensure use of the subway to its greatest effect, and, in turn, to ensure that rail supports other investments. Through land use planning and regulation, high-density urban development is encouraged around stations and discouraged where it can be less easily served. In this manner, rail service supports and, in some cases, guides development where local policy deems it appropriate and desirable.

This philosophy continues in force as the Toronto Transit Commission follows its agenda of extensions and modernization projects.

Scarborough Light Rail Transit Line: One of Toronto's most exciting transit projects is its Scarborough Light Rail Line. It represents a conscious effort to use transit as a means to achieve coordinated and efficient metropolitan development.

For some time, the region has pursued development of a number of metropolitan subcenters. With a concentrated mix of land uses, this was to relieve some of the demands for space and congestion downtown as well as to avoid further sprawl at the fringe. One of these focal points is to be the Scarborough Town Center.

The population of metropolitan Toronto has been projected to grow by about 600,000 between 1977 and the end of the century. More than one-third of that increase is estimated to take place in Scarborough, one of six boroughs that make up the metropolitan area. During the same period of time, about 130,000 jobs are expected to be created in Scarborough. The impact of all of this on transportation will be a doubling of the current daily trips generated in Scarborough to about 1.3 million by the year 2001; a full 20% of total trips in the region.

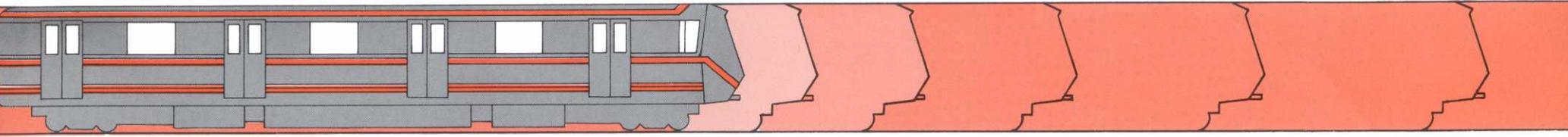
Central to Toronto's efforts to plan for and manage this growth is the development of Scarborough Town Center, served by improved transit service.

The subcenter, conceived in 1968, is being designed as a focal point for the entire borough with regional retail, service, entertainment, administrative, cultural, and institutional uses. According to policies adopted for the center, "It is proposed that the center be developed on a public transit-oriented basis such that eventually at least half of the trips into and out of the center will be by public transit." This is particularly important in light of the more than 30,000 jobs which are forecasted for the town center. From the inception, transit plans have been a part of the overall plan.

Currently, Scarborough Town Center includes the borough civic center, the board of education, and a major shopping mall. Keeping pace with development, formal approval was given by the Ontario Municipal Board in September 1977 to metropolitan Toronto's application to construct a 4.4-mile light rail line to serve the center.

The line will run from an extension of the east-west Bloor-Danforth subway, north on Ontario Hydro Electric Power Commission land and unused Canadian National Railway right-of-way, into the town center. From there it will continue a short distance to a large park-and-ride lot.

With first year ridership estimated at 3600 persons in one direction during each peak hour and an annual ridership of about six million, by 2001 the line is expected to carry 11,000 passengers per peak-hour direction and 30 million passengers yearly. With fare



collection modifications and further grade separation at road crossings, capacity could be upped to as much as 20,000 passengers per peak-hour direction.

The recommended plan calls for two-vehicle trains to begin at a station above the Eglinton/Kennedy heavy rail terminal. The line continues almost entirely at-grade through four stations to Scarborough Town Center. There, platform areas will adjoin a major local and regional bus terminal. Less than one-half mile beyond the center, the line will end at a parking lot with capacity for 500 cars. On-board fare collection is planned for the outer terminal and four of the other stations. One vehicle storage yard and maintenance facility is required.

The current schedule sets 1980 for the beginning of construction on the \$108.7 million (Canadian dollars) project with an opening date sometime in 1982.

Benefits from the light rail line are anticipated to be extensive. The advent of rail service will substantially enhance mobility. A restructuring of bus service into rail feeder lines will speed up travel and open new opportunities to a large majority of Scarborough residents. Moreover, the lion's share of existing and future jobs in the borough is located within the rail corridor. Accessibility to municipal and business services being concentrated in the town center will also be dramatically improved.

In terms of land use, the line will enhance development potential for a number of sites

along the route. In particular, it will encourage more intensive uses of land resulting in minor centers around which currently isolated industrial and residential communities can be further integrated. A by-product might be the relief of development pressures on more distant land. Within the town center, current proposals for additional office and retail space, and particularly two specific developments, rely quite heavily on rail access. Private sector representatives have indicated that the extent of their commitments depend on the light rail line's implementation.

Construction of the Scarborough Line raises another issue. Initial forecasts for ridership, based on traditional transit operating criteria, may not alone justify rail construction at this time. However, the feasibility study for the project addresses this: ". . . (if) the project is deferred even with right-of-way protection, certain opportunities would be missed relative to serving and shaping population and employment growth in Scarborough. If the line is not built in the near future, then the opportunity to increase transit utilization and, therefore, reduce automobile

Toronto: The Facts

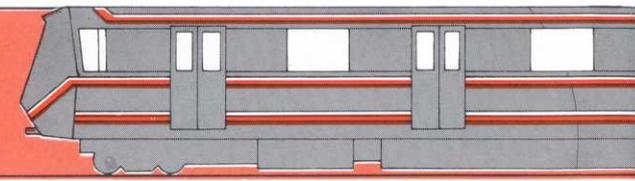
Current System

Length: 32 miles (heavy rail); 44 miles (light rail)
Rail Cars: 628 (heavy rail); 352 (light rail)

Improvement Highlights

Under Way:

- planning for a 4.5-mile light rail line to Scarborough Town Center, scheduled for 1982 opening date;
- construction of 2.6 miles of extensions to the east-west Bloor-Danforth subway, scheduled to open in 1980;
- testing of six prototype light rail cars, 190 production cars to be delivered by 1980;
- recent acceptance of 134 new heavy rail cars; and
- approved replacement of all electro-mechanical subway train dispatchers with a computerized train dispatch and information system.



dependence would be jeopardized, since the rate of growth in Scarborough will be very high in the next 10 to 15 years, and without transit improvements during this period the automobile will continue to dominate . . . the achievement of certain land use benefits as outlined . . . would be inhibited. In particular, employment opportunities and associated social amenities would not take place at the Scarborough Town Center to the degree desired. . . ."

Clearly, in giving its okay to the project, the Ontario Municipal Board recognized and expressed its support for this coordinated approach to metropolitan development. In addition, the light rail line is a strong illustration of the role of rail in a suburban setting.

Bloor-Danforth Extension: Scarborough is only one of a number of rail transit activities in Toronto. Construction work continues at both ends of the Bloor-Danforth heavy rail line.

On the east end of the line, 1.6 miles of route is being added, moving the terminus from Warden to Kennedy, also the beginning of the Scarborough line. At the west end, the subway is being extended approximately one mile from Islington to Kipling Avenue, at a cost of about \$49 million (Canadian dollars).

Most of the \$91 million (Canadian dollars) eastern extension will be underground, and, when completed in 1980, the multilevel station will include parking space for 510 automobiles and kiss-and-ride lanes along

with the Scarborough transfer terminal. Also scheduled for a 1980 opening date, the western extension will include a 1221-car parking lot and a kiss-and-ride facility.

New Vehicles: Production of 190 new light rail vehicles for Toronto is under way by Hawker-Siddeley Canada, Ltd. Six prototype vehicles are currently undergoing testing on streetcar routes. The 190 production vehicles are scheduled to be delivered by 1980 and will be used to replace the nonrehabilitated streetcars in the PCC fleet. Suitably modified, the new vehicles will also be used on the Scarborough light rail transit line. Design of the cars stresses comfort, convenience, and safety as well as servicing ease, accessibility for maintenance, and clear information display.

The final vehicles in Toronto's 134 heavy rail car order from Hawker-Siddeley Canada, Ltd., were delivered recently. The new cars are equipped with energy-saving devices. Other features include air conditioning, a larger motorman's cab, brighter interior, color scheme, new heating system, and improved seating.

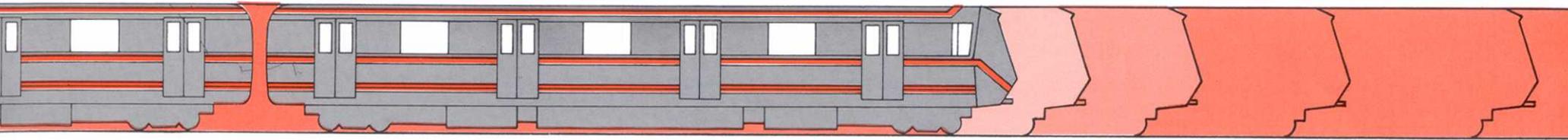
New Technology: Based on successful test results, the Toronto Transit Commission has approved the replacement of all electro-mechanical subway train dispatchers with a new computerized train dispatch and information system. In addition to replacing the older train dispatching equipment, the new system provides facilities for improved schedule control and facilitates a quicker response to subway delays or unusual service changes

and accommodates future expansion. Also, the availability of subway operating data in computer-readable form facilitates the recording of specific subway operating characteristics and the pinpointing of areas requiring improvement. Considerable savings in energy because of improved train control will be another benefit of the system. Data logging and train run number identification are currently in effect on the Yonge and Spadina subway lines. Parallel dispatching is scheduled to begin this summer. By year end, the new system will be expanded to cover the Bloor-Danforth Line and subsequent extensions.

Metropolitan Toronto and its rail transit network continue to grow together. The beneficiaries are 2.2 million Toronto residents who have an increasingly exciting city to travel around and an increasingly exciting way to travel.

Cleveland

A new state office building nearing completion in downtown Cleveland may just become a symbol of that region's confidence in its rail network. Parking for the structure, an all-too-routine feature of new development, has been eliminated in favor of a pedestrian connection to the Public Square rail station.



When all is completed, rail will be an integral element in the creation of a desirable downtown work place.

With nearly two million people in the metropolitan area, the Cleveland region remains a major industrial, commercial, and cultural center. After New York and Chicago, the largest number of Fortune 500 corporations maintain headquarters in the area, most in the central city. And, several central business district development projects are in the design or construction phase. Along with this, Cleveland's commitment to rail transit stands firm.

Ever since two real estate developers constructed the Shaker Heights rapid transit line, over 60 years ago, to attract people to a subdivision they were building, Cleveland has seen and used its rail service as an important resource. In 1968, the region became the first in North America to link its airport to downtown via a direct rail connection. Today, Cleveland is in the process of carrying out an ambitious program of improvements on both the heavy rail and light rail systems.

New Vehicles: Starting in July 1980, the first three prototypes of 48 new articulated light rail vehicles are scheduled for testing on the Greater Cleveland Regional Transit Authority's 13 miles of light rail line. Depending on test results, the remainder of the order is to be delivered by early 1981. The cars, under construction by Breda Costruzioni Ferroviarie of Pistoia, Italy, are to be assembled locally. Total cost is estimated at

nearly \$31 million. The new cars, with seating capacity for 84 persons, will replace most of the current fleet.

On the 19-mile heavy rail transit line, procurement of up to 70 new cars will soon begin. These are to replace older vehicles purchased in 1955 and 1958. The Airporter cars of more recent vintage are to be retained. The bill for the new cars is expected to be about \$52 million.

Station Rehabilitation: In addition to vehicle replacements, the overall capital pro-

gram for the next two years calls for extensive rebuilding and modernization work. Architecture and engineering work for most of the projects is under way with the first construction activities beginning during summer 1979.

Nine million dollars worth of improvements will bring a new look to most stations. This includes the rehabilitation of platform and waiting areas, repaving of parking lots, and the installation of wind screens, seating, increased lighting, and other amenities. A

Cleveland: The Facts

Current System

Length:	19 miles (heavy rail); 13 miles (light rail)
Rail Cars:	176

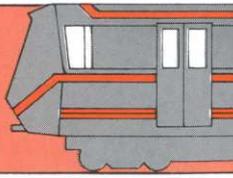
Improvement Highlights

Under Way:

- 48 light rail cars under construction;
- central rail maintenance and operations facility under design;
- six maintenance vehicles to be delivered in 1979;
- alternatives analysis under way to select priority corridors for rail expansion; and
- alternatives analysis under way for light rail extension.

Planned:

- purchase of 70 heavy rail vehicles;
- rehabilitation of track, power supply, and overhead distribution on light rail system;
- rehabilitation of station areas;
- installation of cab signal system; and
- new operations control center.



greatly improved multimodal transfer station is to be built at the East 34th Street Station on the edge of downtown, offering an enclosed interchange area for rail and bus passengers.

Maintenance and Operations: Perhaps more of a behind-the-scenes nature, but every bit as important, maintenance and operations facilities are in for a major upgrading.

Rehabilitation of track, power supply, and

overhead distribution on light rail will cost about \$18 million, with 26 one-way track miles being rebuilt with new rail, ties, and ballast in order to provide a smoother and more comfortable ride for passengers and to allow the new equipment to deliver its maximum performance.

The higher power requirements of the new cars will be met by adding to the existing power conversion system and replacing an

existing substation with a larger-capacity unit. The entire overhead catenary on the light rail lines, which is now 60 years old, will be replaced with a heavier-duty system designed especially to accommodate the new equipment, improving the efficiency of conveying power.

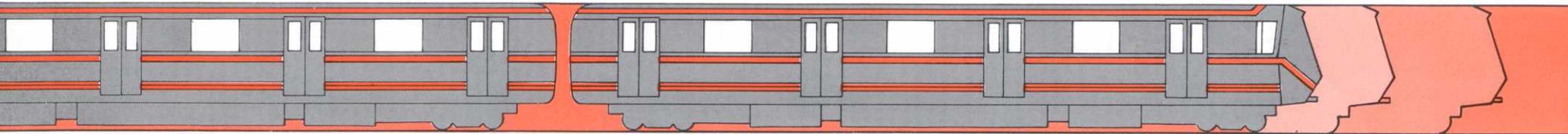
Other right-of-way improvements will cost about \$5 million, including replacement or rehabilitation of the retaining walls and drainage system along the light rail lines.

Design work has also begun on a new central rail maintenance and operations facility adjacent to the tracks of both systems which will provide space for maintaining both light rail and rapid transit cars at a single location. Total cost for this major project is estimated at \$34 million. A cab signal system will be installed throughout the rail system as well.

A completely new operations control center is planned for GCRTA's new main offices which will combine the functions of four existing control towers on the rapid transit line. For the first time, the light rail lines will also be tied into central control. Radio control facilities and the electric power dispatching function will also be relocated to the new operations control center. The combined cost of the center and expansion of the cab signal system to cover the entire rail system will be about \$23 million.

Extensions: The region is currently exploring a program of staged extensions to





the existing rail network. An alternatives analysis study is under way; the first phase has involved selecting priority corridors for rail transit and selecting the most feasible options.

A projected extension to the light rail line is undergoing detailed alternatives analysis, with four options under consideration. The objective is to tap the potential for park-and-ride service in a low-density area beyond the present end of the Green Road branch of the Shaker Rapid. A center median 500 feet wide reaches a busy freeway which could feed an exclusive park-and-ride lot for 1500 or more cars. The estimated \$28 million cost of the rail alternative includes the highway interchange, parking lots, three stations, and 10 light rail vehicles similar to those now on order. A key piece of real estate needed for the project, the center median for one-half mile, has already been acquired.

This proposed extension is expected to attract about 4900 new rides per day by 1990, substantially reducing automotive traffic and air pollution in the heavily traveled corridor due east from downtown Cleveland. By extending the line 1.8 miles, the present 9.8-mile line will enjoy a higher volume of riders and operate at greater system efficiency. Because the right-of-way has been left intact since the street network was laid out in 1927, this is a low-cost opportunity for rail transit extension.

Area Benefits: The net effect of this blend of improvements is expected to be substantial.

By increasing rail transit's capacity and ability to divert auto trips, savings in regional energy consumption are anticipated. In particular, the Cleveland area's dependence on coal and nuclear power for the generation of electricity will mean full savings of petroleum from replaced auto travel. At the same time, rail modernization in Cleveland will create jobs and enhance access to downtown.

During 1978, Cleveland's rail lines carried 15.8 million passengers, up from 15.5 million in the previous year. A full agenda of modernization programs is responding to and creating increased demand for rail transit in Cleveland.

San Francisco

If you're out shopping for a rail system, San Francisco is the showroom. With four rail modes in operation—heavy, light, commuter, and cable car—rail transit plays a major role in meeting the region's transportation demand.

San Francisco has managed to maintain a quality of life to which many cities aspire. Its downtown is strong and the object of tremendous interest within the development community. A mixture of uses, in many sectors, ensures that the streets are alive with activity at most hours of the day and night. The city's neighborhoods have preserved a vibrant community life with thriving clus-

ters of merchants and a high level of services. A splendid natural setting helps to make San Francisco one of the nation's top tourist spots. And, all of this is supported by an effective network of transit lines.

The region is served by six transit operators with a strong rail orientation.

In 1972, the San Francisco Bay Area Rapid Transit District began operations, offering a new level of speed and comfort in rail service. BART ties the metropolitan area together with heavy rail service from Daly City in San Mateo County, south of the city, through San Francisco via its major thoroughfare, and on to communities in the East Bay. As a new system, it is still in the process of refining its service and achieving its maximum passenger capacity.

Southern Pacific Railway continues to operate commuter service from San Mateo and Santa Clara counties on the southern portion of the San Francisco peninsula into the city. With a unique local financing plan in operation, bi-level trains run during the rush hours and throughout the day, often carrying standing-room only crowds.

Within the city itself, the San Francisco Municipal Railway, the oldest publicly owned transit system in the country, operates five light rail lines connecting outer neighborhoods with the central business district, and three cable car lines which—in addition to providing residents with local transit service—are on almost every San Francisco visitor's list of "musts."

Major improvements are in store for both the light rail and cable car operations:

Muni Metro: Constructed in conjunction with the Market Street segment of BART, Muni Metro will carry light rail vehicles to a terminal at the Embarcadero.

At present, five street car lines travel from various sections of the city to a point where they merge, just northeast of the Twin Peaks hills and near the beginning of Market Street. From there, the lines run along the surface

to the Transbay Terminal, near the foot of Market Street.

With the opening of Muni Metro, light rail lines will feed into the subway under Market. Nine new stations are included in the project, of which the four downtown stations will be shared with BART. As constructed, BART occupies the lower level and Muni Metro the upper level. Scheduled for a late 1979 or early 1980 opening date, Metro will be served exclusively by 100 new Boeing Vertol-manufac-

tured light rail vehicles. The cars are presently being delivered. One current operating option is to couple several cars at the merge point and run them as a train beneath Market Street. Increased capacity and shorter travel times can be attained in this manner.

Regardless of the operating technique, however, Muni Metro will mean time savings for travelers. The new cars, operating faster than the PCC vehicles they will replace, as well as making fewer stops along the downtown stretch, will cut running times on several of the routes drastically. Where a trip to the Transbay Terminal zoo on the L-route currently takes 52 minutes, Muni Metro will cut that to 34 minutes. The 50-minute trip from the beach on the N-route will be cut to 35 minutes. Moreover, the increased capacity of the new cars means more seats available so more passengers can ride.

Certainly, a reserved right-of-way will result in less Market Street congestion and an even safer operation. Additionally, the system stands to gain from an operational standpoint. Faster running times and more efficient turn-arounds ensure a more effective utilization of vehicles.

Currently, plans call for a gradual phase-in of Metro. One line will be diverted into the subway with others to follow. With few precedents for this type of service, the transit operator will have an opportunity to work out any last-minute service bugs without interruptions.

Since plans were first announced for rail

San Francisco: The Facts

Current System (San Francisco Municipal Railway)

Length: 32 miles (light rail); 10 miles (cable car)
Vehicles: 126 (light rail); 39 (cable car)

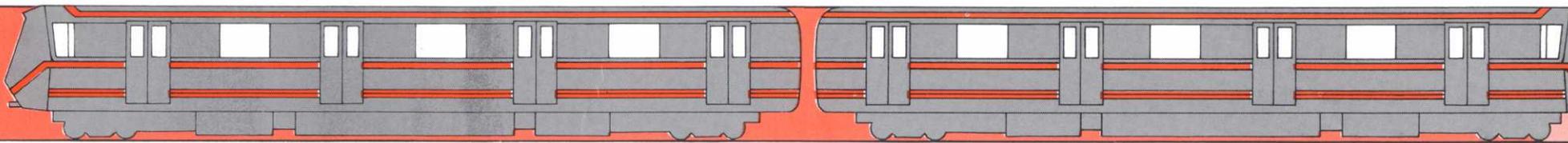
Improvement Highlights

Under Way:

- completion of Muni Metro beneath Market Street;
- delivery of 100 new light rail vehicles;
- upgrading of cable cars, tracks, powerhouse, and carbarn; and
- completion of Muni Metro Rail Center maintenance facility.

Planned:

- Embarcadero Station light rail loop;
- extension of J-line service;
- creation of a link from Embarcadero to Southern Pacific Depot;
- development of a waterfront light rail line; and
- extensions to cable car service.



service beneath Market Street back in the 1960s, the face of the thoroughfare has been transformed. Extensive surface improvements have been made with the widening of sidewalks, the development of squares, and the additions of improved lighting, signs, and other street furniture. Millions of dollars worth of new construction have taken place, characterized by the massive Embarcadero Center with apartments, a major hotel, offices, and retail space. A number of the buildings afford direct subway entry. A series of landscaped plazas have also become part of the Market Street scene, many of which were developed by the private sector.

Light Rail Extensions: San Francisco is exploring a number of extensions to its light rail routes to allow a more efficient operation with better coverage.

One proposal calls for the addition of a loop at the end of Muni Metro, beyond the Embarcadero Terminal. Currently, light rail cars will terminate at the station, which is designed as a stub, meaning that the cars will simply reverse direction in order to leave the station.

A loop turnaround will significantly increase operational reliability and reduce any possibility of delay. Increased flexibility coupled with availability of additional storage space on the loop will increase overall capacity of the system. Additionally, the project would provide the layout necessary to separate vehicles which proceed on a possible extension from Embarcadero.

An extension of the J-line service is under exploration to enhance service to San Francisco's Mission district, a community with average income lower than the city norm and a heavily transit-dependent group of residents. The combination of the new trackage along with minor adjustments to existing bus service would culminate in a far higher level of service to residents than each mode could achieve independently. Moreover, the extension will provide a connection for vehicles to reach Muni's new Metro Rail Center main-

tenance facility, enhancing the flexibility of the entire network.

As part of an effort to improve transfer opportunities between modes, a third extension from the Embarcadero Terminal to Southern Pacific's commuter rail depot is under study. SP trains currently terminate at a location just outside of downtown, requiring the use of shuttle buses to take riders to the financial district and other downtown office centers. The link, for which a planning and design study was recently initiated, presents the op-



portunity to serve a number of local goals with a relatively low-cost improvement.

The light rail segment would provide high-speed, high-capacity service from the SP depot to the financial district, civic center, and other major destinations. It would relieve congestion which might occur at Embarcadero if the station were to remain a terminus for all lines. Finally, the line has the potential of stimulating development in the locale of the SP station, an area in which substantial vacant parcels exist for rail-related facilities as well as private projects.

Waterfront Rail Line: One of the most exciting proposals for rail transit improvement is a plan to construct a light rail line to ring San Francisco's waterfront area. Running from the numerous attractions and restaurants in the Fisherman's Wharf area, past structures at the base of Telegraph Hill, past Embarcadero Center and the Ferry Building, the route would terminate near the SP depot.

Using existing freight tracks along the bay and PCC street cars from the existing fleet, the waterfront line can be put into operation for a small investment.

Establishment of the service holds great promise for addressing various local concerns regarding harbor development by enhancing accessibility to existing activity centers and stimulating redevelopment in deteriorating sections.

Specifically, the line will improve transportation for visitors to the Fisherman's Wharf area. Over the last 10 years, existing wharf at-

tractions have been complemented by the development of major complexes like Ghirardelli Square, Pier 39, and the Cannery, adding thousands of square feet of tourist-oriented retail and entertainment space. With tourism steadily building, traffic conditions in the area are among the worst in the city. Currently, extremely overburdened cable cars almost exclusively handle Wharf visitor traffic. Long lines forming to board the cars are routine sights. A waterfront light rail line could double, at minimum, the capacity of the cable car system by providing alternative access. The use of distinctive "historic-type" cars would further increase the attractiveness to visitors. By relieving cable car congestion, that system would also be more available to serve the other neighborhoods through which it runs.

The new service would support expanding new commercial developments to the northeast of Fisherman's Wharf. As land along much of the waterfront continues to shift from maritime, warehousing, and light industry to white-collar commercial and administrative activity, there is a corresponding growth in travel to the area, particularly during the traditional peak periods. The line would link such points as the Ferry Building, with its services to Marin County, the Hyatt Regency Hotel, the end of the California Street crosstown cable car line, a proposed waterfront promenade, and Market Street. Additionally, the service would complement plans for the development of the Golden Gate National Recreation Area.

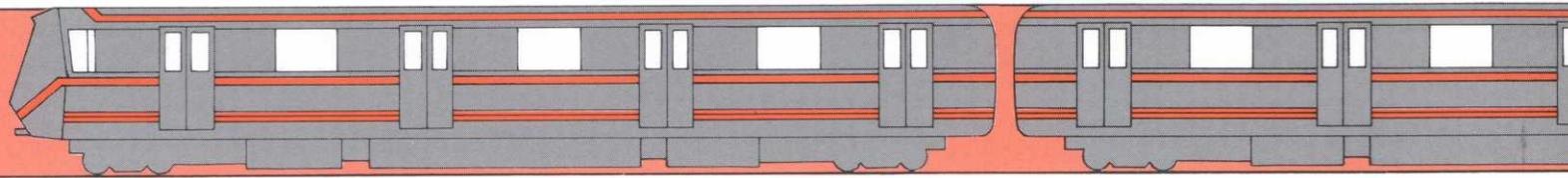
Cable Car Improvements: San Francisco's legendary cable car system, with historic landmark designation, is in for a number of service and operational improvements.

A major engineering study is in progress to prepare for reconstruction of the powerhouse and carbarn. The city is hopeful to see the start of rebuilding in October 1979. Similarly ongoing upgrading of the track and way is to be accelerated to provide reconstruction and rerailling of the entire existing system.

With 39 vehicles, few of which are exactly alike, a major effort is being mounted to develop standard specifications. This is to lead to one design for a new "old" car, using cable car technology but incorporating modern methods wherever possible. A number of cars are being totally rebuilt now.

In a system which at one time was slated for abolition, several extensions of cable car service are being explored. One plan would continue the California Street car from its present terminus at Market Street to the Ferry Building. This would particularly benefit the commuters who arrive on the ferries from the suburbs and are in need of a downtown distribution service.

A second proposal calls for a new cable car line over existing trackage connecting California Street with the Fisherman's Wharf area, resulting in increased capacity to serve the waterfront. A third option would extend California Street service to a new terminal, possibly located at the Japan Center, a cultural complex.



Metro Rail Center: San Francisco recently completed a \$16 million Muni Metro Rail Center, featuring heavy maintenance bays, a completely modern machine shop, and other support facilities. The complex was designed largely to house the new light rail vehicle fleet, but also contains maintenance and cleaning operations.

Metro Center, with 2.5 miles of track and capacity for holding about 100 light rail cars, includes offices, storerooms, an overhaul shop, an electronic shop, an electrical motor repair shop, a paint shop, fare collection service, and running repair shop facilities.

Adjacent to the center, a terminal has been constructed at BART's Balboa Park Station. This will accommodate direct across-the-platform transfer of heavy and light rail passengers.

San Francisco's program of rail improvements illustrates the region's confidence in its transit service and in the role it can play. In describing the modernization and extensions efforts, Muni General Manager Curtis Green recently noted that all of these activities are a sign of transit's establishing itself "as a positive and vigorous force in the advocacy and development of good transit service in San Francisco—and of all the things that good transit can mean: protection of the quality of life in the city's neighborhoods, reinforcement of the city's vital commercial districts, defense against the degradation of the urban environment, and the right to live a full life without having to own an automobile."

Pittsburgh

Visit Pittsburgh and it is clear that nature, as much as man, played a major role in the city's development. The Allegheny and Monongahela rivers join to form the Ohio River giving Pittsburgh's downtown a triangular shape and its name, "The Golden Triangle." Like San Francisco, city and suburban streets and roads run up and down steep hills. Unlike San Francisco, severe winters with heavy icing and snow batter the region.

The influence of the hills and valleys has been to direct development and channel move-

ments of people and goods, while the rivers have acted as barriers encouraging development in a linear pattern.

Downtown Pittsburgh is primarily an office center, with significant support activities including advertising, printing, and data processing, as well as restaurants and entertainment. There is some residential development as well, and it is city policy to encourage conversion of commercial to residential space in downtown.

The central business district provides daytime employment for about 125,000 people, with 15 of the "Fortune 500" corporations headquartered there and offices for city, county, state, and federal agencies. This concentration makes Pittsburgh very much a center for commerce and government.

Pittsburgh: The Facts

Current System

Length: 35 miles (light rail); 18 miles (commuter rail)
 Vehicles: 95 (light rail); 9 (commuter rail)

Improvement Highlights

Planned:

- complete reconstruction of the South Hills light rail line;
- purchase of 55 new light rail vehicles; and
- construction of a subway distribution system in downtown Pittsburgh.

Urban development plans emphasize diversification of economic activity with stabilization of the traditional manufacturing base. Currently, downtown Pittsburgh is densely built, with narrow and congested streets. While several parks and open areas have been added in recent years, pedestrians continue to vie with traffic for use of the streets.

All of this suggests that good transit service is an essential element in the Pittsburgh region. The people of the area have had just that, provided by a mix of buses, light rail, commuter rail, and where the grades are nothing less than straight up, two incline railways.

South Hills Corridor: The South Hills Corridor, one of the most well-defined slices

of suburban and city neighborhoods in the region, is the focus of a massive rail upgrading and rebuilding project.

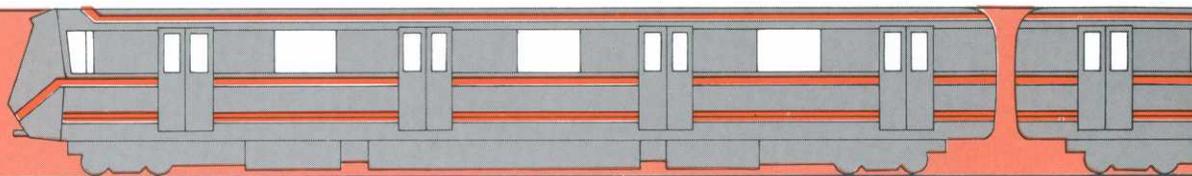
The communities making up the South Hills Corridor, situated to the southwest of downtown Pittsburgh, are currently served by trolley cars running over 24 miles of track and carrying more than 25,000 daily riders.

Under a light rail improvement plan, Stage 1 improvements would involve complete reconstruction of 10.5 miles of the existing system plus electrical rehabilitation of the remaining 12 miles. On the 10.5-mile segment, new double track would be installed along with approximately 16 stops with passenger shelters and 13 stations with special facilities for the elderly and handicapped. In addition, selected locations would offer bus transfers, taxi bays, kiss-and-ride areas, and park-and-ride facilities. In Stage 1, the remaining mileage would receive new signals and other electrical components.

Beyond changes to the existing alignment, plans call for an extension to the South Hills Village Shopping Center, a new tunnel, an express entry across the Monongahela River into the central business district, and a downtown distribution system consisting of a subway routing to the Gateway Center, a major office and commercial focal point.

Part of Stage 1 will be the purchase of new light rail vehicles. About 55 cars will be needed initially to meet patronage requirements through 1985. These will be serviced in a new car storage and maintenance complex





for both older and the newer cars, to be located at the southern terminus of the line. Among the functions of the shops will be storage, cleaning, maintenance, spare stock inventory, and repair along with centralized control.

New Parking lots are to be provided at the South Hills Village Station for about 1000 cars and at other stations with capacity for from 100 to 600 vehicles. An extensive sequence of bridge construction and reconstruction will be undertaken as well.

Stage 2 activities involve complete reconstruction of the remainder of the existing line.

The entire project is integrated with other transit improvements, either recently completed or planned, in the Pittsburgh metropolitan area. Particularly, this includes coordination with a system of busways, one of which shares the light rail right-of-way for a distance.

Projections for system usage indicate that 142,000 daily trips will be made on the reconstructed line by the year 2000 and that implementation of the light rail improvements holds a number of benefits for the Pittsburgh region as well as the corridor and the central city.

What is considered South Hills is a well-developed residential, commercial, and industrial areas which include both Pittsburgh neighborhoods and suburban communities. The corridor is basically defined by narrow stream valleys and steep slopes. These have caused development to occur primarily along

valleys and lower hills. The approximate population of the area was 181,000 in 1970. South Hills represents varied social, economic, and community characteristics with residential development ranging from intense, small-lot, medium densities to more open arrangements farther out. Similarly, both less affluent populations and higher-income families live in the corridor with correspondingly wide ranges in automobile ownership.

In general, development of the line will enhance transportation opportunities to all residents of the corridor. With three-quarters of the households in South Hills having one or no car, mobility will be enhanced, particularly for students and the elderly. Substantial reductions in automobile travel in the corridor are also predicted, ranging up to a 50% drop in downtown Pittsburgh. The system is also expected to bring about an increase in choice ridership from the current 20% level up to 40-45%.

Extensive benefits to the Pittsburgh regional economy are also traced to the project. The direct local impact of transit spending is to be in excess of \$146.3 million for heavy construction and business services, and almost 2800 additional person-years of employment for the Pittsburgh region. A \$146 million investment would stimulate multiplier effects of at least \$212 million of production in the regional economy. Indications are that the payrolls resulting from the project construction would produce an increase in direct retail expenditures of more than \$33.6 million.

Similarly, construction would generate increases in income, business, and property tax revenues with an \$18 million increase in federal and state receipts alone.

Many of the communities involved see local stations as sources of increased retail traffic as well as presenting new development, opportunities. In particular, South Hills Village with its adjacent shopping mall and jurisdictions like Mt. Lebanon, McFarland, Washington Junction, and Castle Shannon stand to gain.

With reduced levels of automobile traffic, transportation-produced pollutants can be expected to decrease and help to keep the region from exceeding state and federal standards. Reduced auto travel is also predicted to result in an overall 7% reduction in energy consumption for roadway traffic with daily operating energy consumption to decrease from 9.39 billion BTUs to 9.10 billion BTUs.

One of the major advantages of light rail transit—its flexibility—is a major factor in the South Hills decision. Trains will run in subway in congested central Pittsburgh, mixed with street traffic in suburban areas, and on a separate, surface right-of-way through much of the parklands and open space. A combination of closely spaced street stops and more widely spaced stations will allow for travel by both walk-in patrons and passengers from bus feeders and those who park-and-ride.

From dealing with weather conditions to overburdened roadways, the South Hills corridor light rail line project will solve a host of problems in the Pittsburgh area.

Chicago

It would be hard to imagine Chicago without rail service. The history of the city is intricately bound to that of the transcontinental railroads which transformed Chicago into a center of commerce and industry.

Similarly, rail transit has played a major role in both Chicago's outward and upward growth. Several of the area's early elevated lines terminated in what were then farmlands. Development followed, creating urban corridors with convenient access. Downtown, rapid transit literally framed the business district and, in fact, gave it its present name—the Loop.

With an extensive network of rapid transit and commuter lines today, rail has remained at the heart of Chicago's transit orientation. Each weekday, about 85% of those who travel downtown do so on public transportation. These services have been credited with maintaining a lively and thriving central business district over the course of many years. The Loop and the North Michigan Avenue Corridor continue to be growing centers of office, retail, and housing activity, with generous amounts of new construction under way and investments in the works.

Outside of the central city, rail stations act as focal points for local communities. The legendary Skokie Swift, linking suburban

Skokie with North Side rapid transit lines, opened up a convenient entry to central Chicago to thousands of residents in the 1960s. As one of the nation's first federally sponsored mass transportation demonstration projects, the line is responsible for measurable reductions in air pollutants in the corridor it serves. Moreover, a system of universal transfers and feeder bus service to commuter and rapid rail stations have allowed many residents to give up a second car.

A wide agenda of rail improvements is now being implemented to ensure the prominence of rail in Chicago in years to come.

O'Hare Airport Extension: Chicago air travelers have found that, despite the convenience and speed of flying, they don't really end up where they are headed. Flying to Detroit actually means landing in Romulus, Mich.; winging it to New York can mean landing in South Jamaica; and airliners to Chicago touch down in Des Plaines, Ill. In Chicago, that may be less of a problem soon with the introduction of a direct rail connection from O'Hare International Airport to downtown.

At present, a Loop-bound automobile trip from O'Hare, the world's busiest airport, can take up to two hours on the bumper-to-bumper Kennedy Expressway. In light of this, Chicago is pursuing a solution adopted in Cleveland and Washington, D.C., that of extending rapid transit service to the airport, cutting travel time to about 35 minutes. With construction scheduled for a summer 1979 start, the project is estimated to cost in ex-

cess of \$136 million and be operational by the end of 1981.

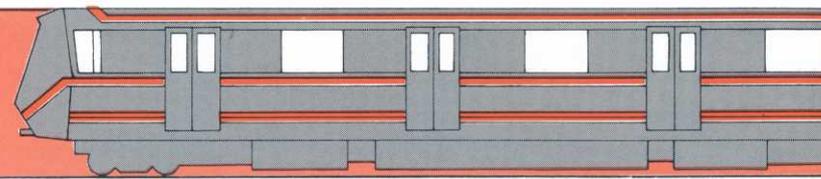
The O'Hare link will cover a distance of eight miles between the airport and the Jefferson Park Transit Center. Jefferson Park is the present terminus of the Kennedy rapid transit line and transfer point for 16 suburban bus routes and commuter trains.

Initially, more than 36,500 daily riders are expected to use the segment, serving air travelers as well as the thousands of employees of the airport and nearby hotel and commercial district.

The two-track line will continue in the median strip of the Kennedy Expressway to a point where it will break off into the median strip of the O'Hare access road. About 500 feet west of the airport runways, the route will enter a tunnel and curve into a station beneath the main parking garage. Intermediate stations are planned for Harlem, Cumberland, and East River Road. At those locations, parking for more than 2500 autos will be provided. Supporting facilities will include a storage yard for 180 rail cars, an inspection shop, and electrical substations.

Running in the median strip of the expressway, like many of Chicago's other rail lines, trains should provide excellent views of daily traffic congestion.

State Street Transit Mall: State Street has long been a premier transit street in Chicago. It is served by 2300 bus trips each day on its surface and one of the busiest subway lines in the region beneath. This coverage is needed,



as the city's major department stores and a number of its larger office buildings have State Street addresses.

The nine-block State Street Mail project will transform the thoroughfare into a pedestrian-oriented corridor with two lanes of roadway, open only to buses and emergency vehicles. It will dramatically enhance surface operations by speeding up bus travel times and rail service by making access to stations both easier and more attractive.

With construction well under way, completion is targeted for October 1979, just in time for the Thanksgiving and Christmas shopping seasons.

One of the features of the project will be the installation of covered escalators from the street level to subway station mezzanines in each block on both sides of the street. An elevator is also part of the plan.

Sidewalks are being extended from the present curbs toward the center lines of the street, in some areas as much as 24 feet. Resurfacing and mid-block pedestrian crossings are also included in the work. The mall itself will offer landscaping, seating areas, unmanned postal stations, drinking fountains, street directories, a year-round information center, public telephones, and small entertainment areas.

Along with improving transit service and State Street's pedestrian environment, the project is designed to provide an economic stimulus to the downtown community. The \$17 million price tag is expected to yield

Chicago: The Facts

Current System

Length:	103 miles (heavy rail)
Rail Cars:	1100 (heavy rail)

Improvement Highlights

Under Way:

- construction of a nine-block State Street Mall with enhanced access to State Street Subway, completion due October 1979;
- construction of an eight-mile rapid transit extension to O'Hare International Airport to begin summer 1979, completion due 1981;
- contract awarded for purchase of 300 new rapid transit cars; and
- purchase of complete two-way radio train communications system.

Planned:

- study and design of 4.65-mile Franklin Street Subway through downtown.

much return in the form of increased sales tax revenues and greater levels of private investment.

In addition to the State Street Subway, rail service to the mall includes the Loop elevated route over Wabash Avenue, one block to the east, and the Dearborn Subway one block to the west.

Franklin Street Subway: In the planning stage is the Franklin Street Subway, which is officially known as the Chicago-Franklin Line Rapid Transit Project. Currently \$4 million for design contracts is available and an en-

vironmental impact statement is at the final approval stage.

The Franklin route is to extend 4.65 miles from 18th Street and the Ryan Expressway on the south to Willow Street (one block north of North Avenue) on the north. Of this route, 3.5 miles is to be underground, eight-tenths of a mile at grade, and slightly more than two-tenths of a mile elevated.

It is expected that this new route would make possible the razing of the Wells and Van Buren legs of the downtown elevated Loop. It also would eliminate the elevated structure

south from Willow Street on the north side.

A second phase of downtown subway construction is to be a new subway under Monroe Street which would permit the razing of the Lake and Wabash Avenue legs of the Loop elevated line.

Station Rehabilitation: In coordination with a street revitalization project, the Western Avenue Station of the Ravenswood rapid transit line is being rebuilt from top to bottom.

The Lincoln Square Mall project involves the development of a three-block street mall in northwest Chicago. Located in an active shopping and restaurant area, the landscaped

pedestrian way is being built by a partnership of the city and the local business community. At one end, the rail station is being redesigned, consistent with the mall plans.

The station will be constructed of steel, brick, and glass with escalator and elevator entry. A canopied area for bus connections is also included in the plan. A \$2.1-million contract for the work was let in March 1979 with an expected completion date during summer 1980.

New Vehicles: Late in 1978, the Chicago Transit Authority awarded a \$133 million contract to The Budd Company for the purchase of 300 new rapid transit cars. Delivery

of two prototype cars is set for 1981, with completion of the order by 1984.

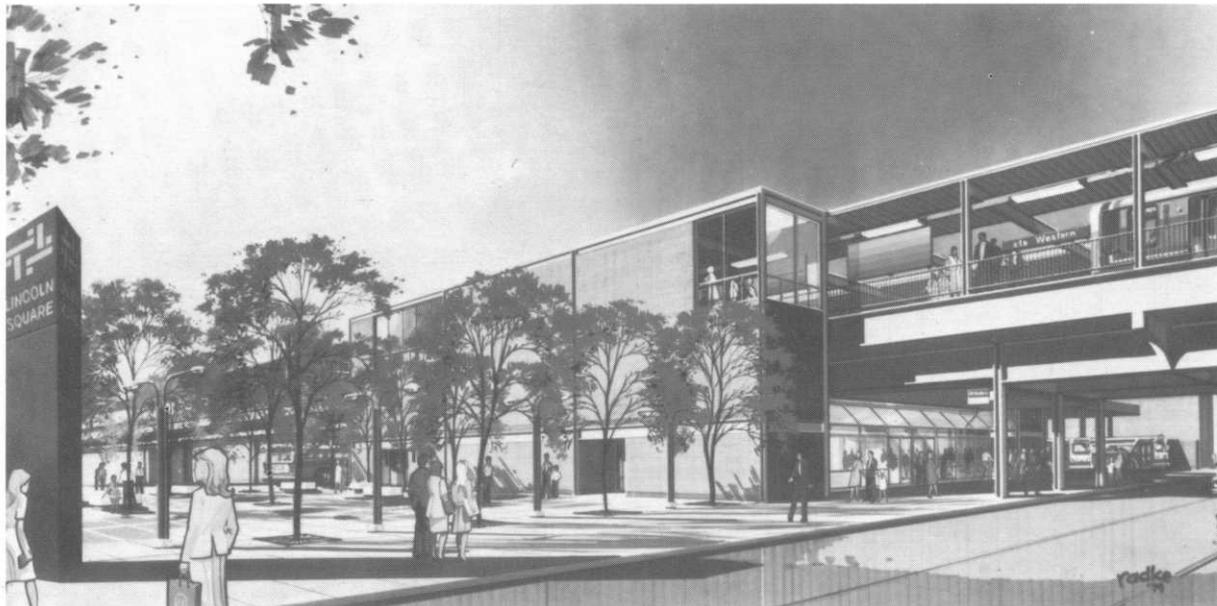
Similar to cars received under a current order, the vehicles will have stainless steel exteriors and large windows. An improved public address system, bright fluorescent lighting, and wide sliding doors are among the features. The cars are to replace vehicles delivered to Chicago between 1950 and 1959.

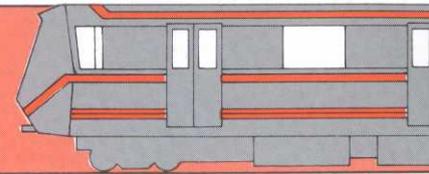
Train Communications: Nearly \$10 million worth of two-way radio train communications equipment is being purchased for the rapid transit lines. With the installation of the complete above and below ground communications system, all motormen, conductors, supervisors, and yard and management personnel will be able to talk instantly with the Chicago Transit Authority control center. The portable radio units for motormen and conductors will also be equipped with emergency alarm features. Moreover, the installation in the subway segments will provide separate radio communications for police and fire department units.

As part of the project, the entire train supervision system within the control center will be expanded and upgraded for the dispatching and monitoring of all train operations.

Implementation of the full communications system will take two years, with the entire above-ground portions in operation late in summer 1979.

Commuter Rail Improvements: Commuter rail is another focus of Chicago's moderniza-





tion efforts, with the implementation of a major program of improvements taking place.

Northeastern Illinois Regional Transportation Authority plans call for rehabilitation of tracks and roadbeds as well as the equipping with on-board signaling systems, to enhance train control.

A rolling stock program will add 90 cars to the 66 bi-level vehicles being delivered this year. In addition, 84 cars are scheduled for rehabilitation by 1984.

In the area of stations, the emphasis will be upon improvements to existing facilities. This includes new and lengthened platform sections, lighting, passenger communications and information equipment, and downtown terminal improvement programs.

A number of projects with specific community development impacts are being proposed. A project in Elgin, Ill., would provide a centralized public transportation facility served by commuter rail and a pulse-scheduled bus system. Adding an intercity bus stop is also possible. Another proposal would construct a new commuter station in Schaumburg, Ill., to serve Roselle and Hanover Park, which have shown 67% and 33% increases respectively in commuter rail usage since 1971. Plans also call for an intermodal transfer facility in Waukegan.

In the areas of urban development, new vehicles, station modernizations, extensions, and new technology, Chicago is renewing its commitment to a rail network which has served and continues to serve with distinction.

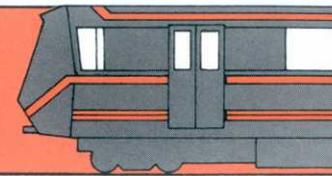


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About the American Public Transit Association

The American Public Transit Association represents the public interest in providing safe, efficient, and economical transit services to all persons and in improving such services in a manner which enhances the quality of life.

It is an association whose members include North American organizations responsible for planning, designing, constructing, financing, and operating transit services. In addition, its members include business organizations which supply products and services to the urban transit community, academic institutions, and public interest groups.

Formed on a cooperative, nonprofit basis, APTA's objectives are:

- to assist the operators of public transit in representing the public interest through the development of common policies, requirements, and purposes;
- to provide a medium for exchange of ideas and experiences;
- to promote research and investigation;
- to aid members in dealing with special issues;
- to encourage cooperation among its members, their employees, and the general public;
- to collect, compile, and make data available to members;
- to encourage industrywide compliance with the letter and spirit of equal opportunity principles; and
- to act as the members' voice in Washington.

APTA is organized to function on behalf of all parts of a diversified transit community. It is governed by a Board of Directors in which the voting control and authority is vested in transit policy board members and transit operating officials who are elected by the membership.

The Board establishes committees which address matters of common interests and which plan and carry out APTA activities. All association committees are open for participation by all classes of members.



